

passion  
for precision

fraisa

## Outils de **perçage et de filetage**



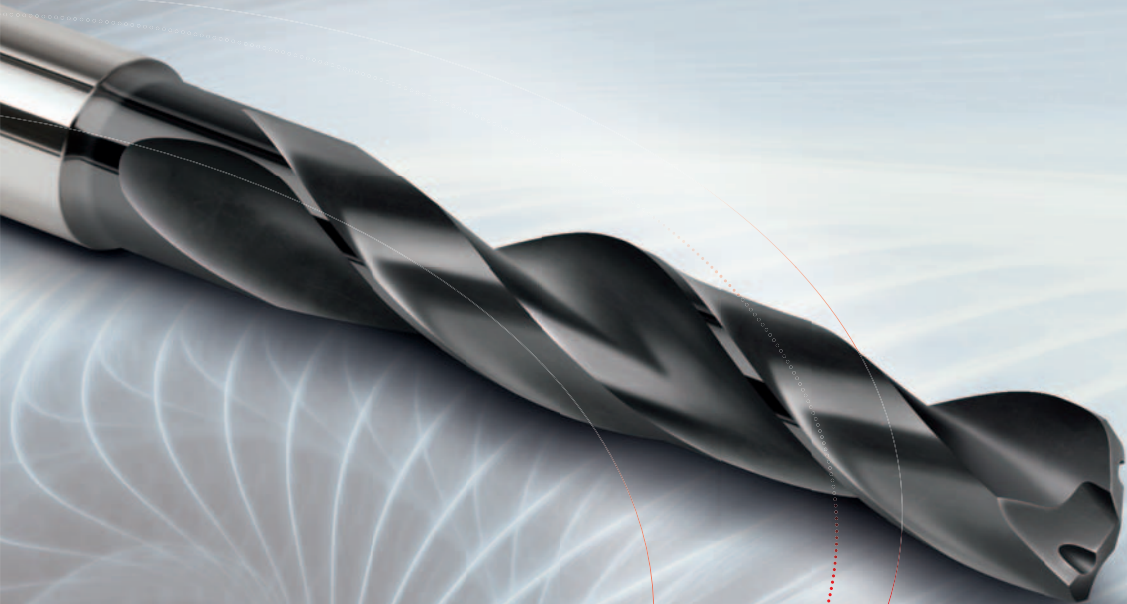


# Outil de perçage XDrill®



- **Outil de perçage haute performance pour l'usinage des matières en acier**  
Convient parfaitement à des aciers jusqu'à  $R_m 1\,500\text{ N/mm}^2$
- **Durée de vie nettement supérieure pour des valeurs d'avance et des vitesses de coupe accrues**  
Grâce à une géométrie de coupe particulièrement stable, un carbure à grain ultrafin et un revêtement haute dureté
- **Nano-revêtement multicouches en carbure résistant à l'usure DURO-X**  
Sécurité de processus élevée grâce au revêtement résistant aux températures, spécialement sélectionné pour l'usinage haute performance
- **Diminution de la durée de traitement jusqu'à plus de 50 %**





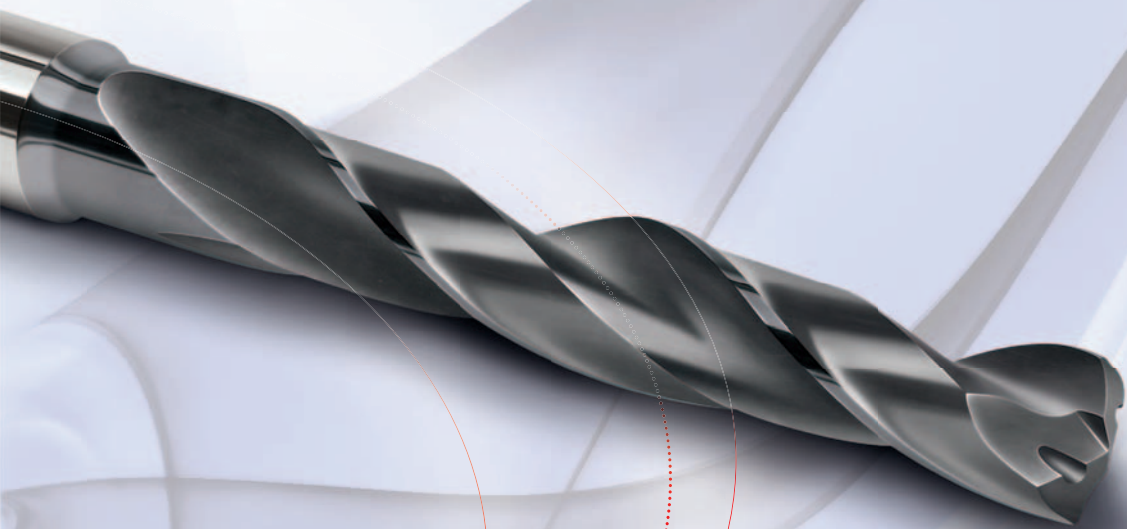
XDRILL®



# Outil de perçage Supradrill® U



- **Usinage universel des matières en acier**  
Perçage avec sécurité de processus dans l'acier ordinaire ou inoxydable
- **Large gamme pour un vaste éventail de pièces et d'applications**  
La gamme de base comprend 3 x D (avec arrosage central),  
5 x D IKZ (avec ou sans arrosage central)
- **Revêtement haute performance Nano-U<sup>2</sup>**  
Le revêtement le plus performant pour le perçage universel dans l'acier
- **Sécurité de processus renforcée, durée de vie prolongée  
et réduction des coûts de fabrication**  
Grâce au concept de revêtement conçu à cet effet et à la conception  
adaptée de l'arête de coupe suivant les dimensions



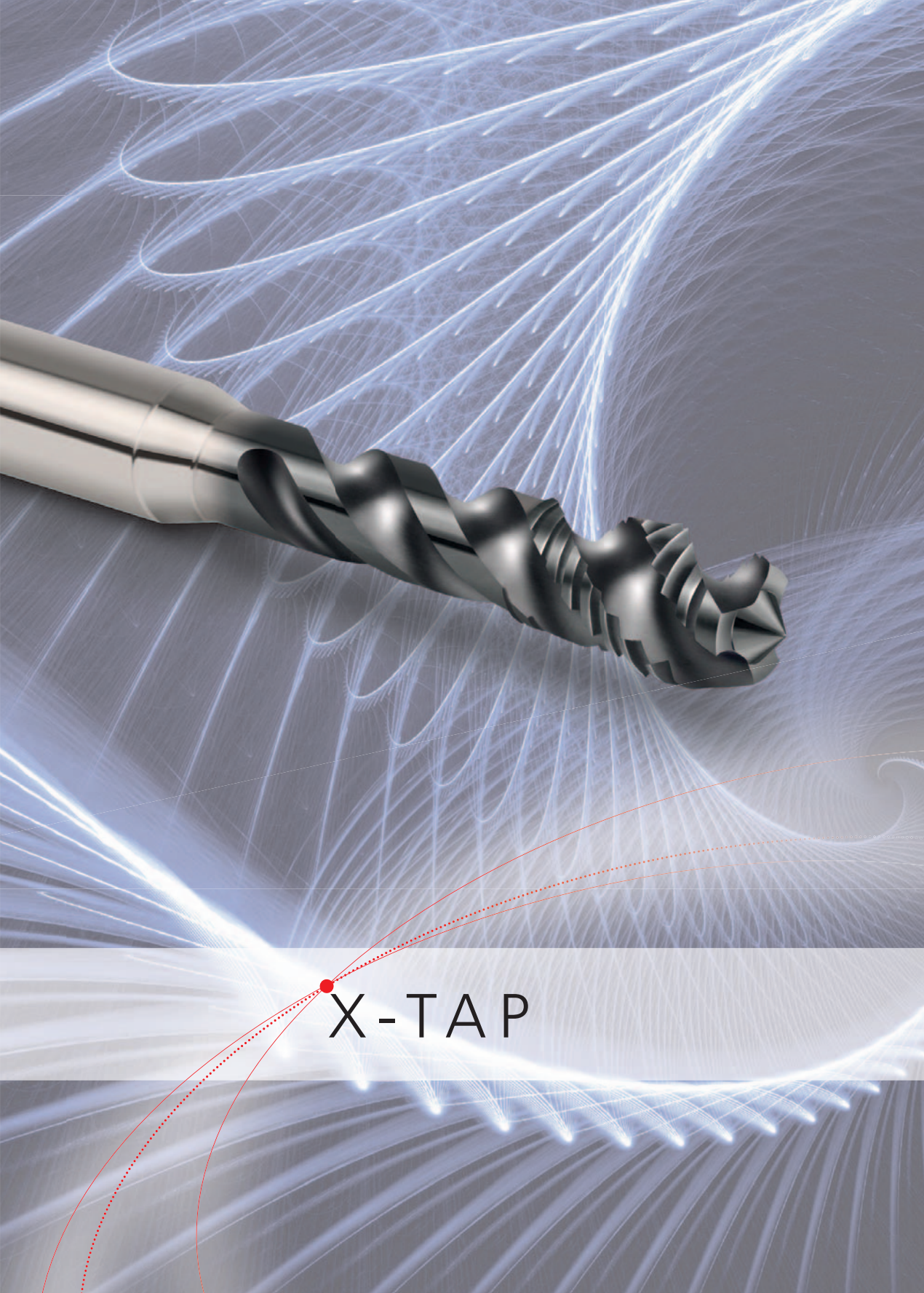
SUPRADRILL® U

# Taraud x-tap



- **Taraud pour l'usinage haute performance de l'acier ordinaire et inoxydable**
- **Sécurité de processus élevée, couple mécanique faible et durée de vie élevée**
- **De nombreux types de filets disponibles pour un large éventail d'applications**  
Sélection sûre des outils et des données d'utilisation grâce à un système de codage
- **Revêtement de matière dure TRIBO**  
Pour l'usinage avec sécurité de processus de l'acier inoxydable



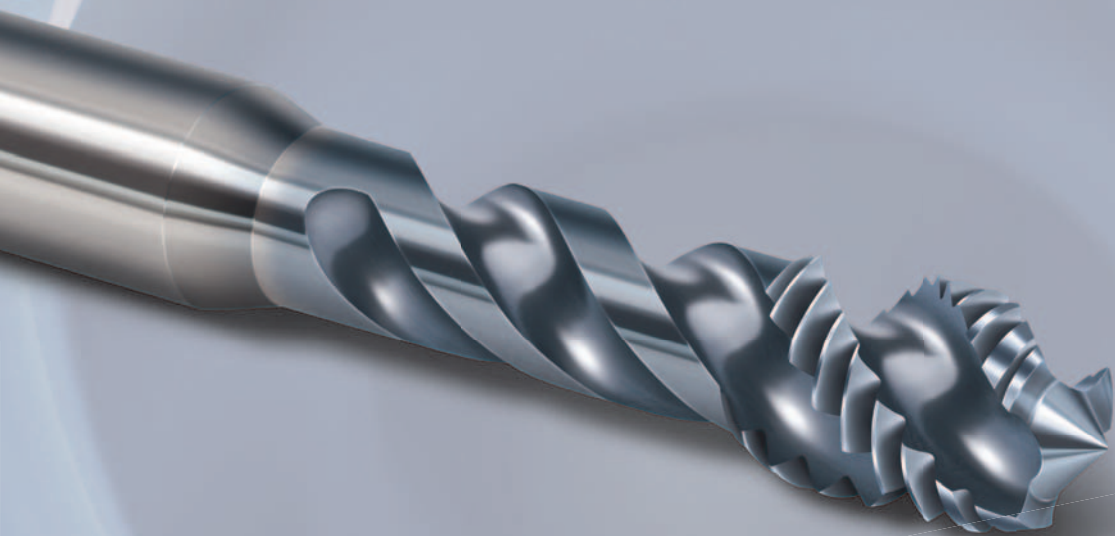


X-TAP

# Taraud s-tap



- **La nouvelle référence en matière de performance pour le taraudage universel de l'acier**
- **Sécurité de processus et durée de vie élevées, automatisation sécurisée**  
Grâce au nouveau substrat, au procédé d'égavurage, au conditionnement spécifique aux dimensions de l'arête de coupe et au revêtement haute performance TiCN
- **Large gamme de base métrique et filetages gaz**  
Pour l'usinage de l'acier, même dans la plage de résistance inférieure
- **Rigid tapping et compensation de longueur**



S-TAP

# Taraud u-tap



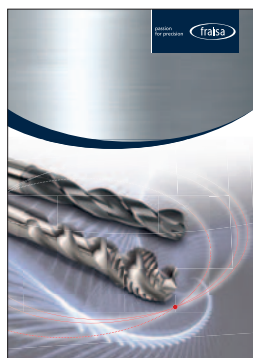
- **Taraud pour une utilisation universelle**
- **Usinage de différentes matières à l'utilisation des toutes dernières technologies**  
Adapté à l'acier ordinaire ou inoxydable et aux alliages d'aluminium corroyés
- **Sécurité de processus élevée et diminution des coûts de fabrication**  
Grâce à une conception optimisée de l'arête de coupe et à une aptitude à l'emploi universelle





U-TAP

Remplace édition 2015/16



[www.fraisalab.com](http://www.fraisalab.com)



**Le supplément sur  
matières premières est  
compris dans le prix.**

|                   |                                                                                                   |                          |
|-------------------|---------------------------------------------------------------------------------------------------|--------------------------|
| Outils de perçage | Outils de perçage pour acier, l'aluminium, inox, titane, CFC, CFC / Matériau composite métallique |                          |
|                   | Forets à pointer, Fraises coniques                                                                | 15 – 135                 |
| Tarauds           | Filetage métrique<br>M / MJ                                                                       | M<br>137 – 243           |
|                   | Filetage métrique pas fin<br>MF                                                                   | MF<br>245 – 269          |
|                   | Filetage Whitworth pas de gaz<br>cylindrique G                                                    | G<br>271 – 301           |
|                   | Filetage américain<br>UNC / UNJC / UNF / UNJF                                                     | UN<br>303 – 335          |
|                   | Filetage américain pas de gaz<br>conique NPT / NPTF                                               | NPT<br>NPTF<br>337 – 343 |
|                   | Filetage métrique pour filets rapportés<br>EG M                                                   | EG<br>345 – 349          |
|                   | Tarauds à refouler / Cold Forming<br>M / MF / EG M                                                | CF<br>351 – 385          |
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|                   | INDEX                                                                                             | INDEX<br>455 – 460       |





# Outils de perçage pour acier, l'aluminium, inox et titane

Forets hélicoïdaux

## 5xd

N° B72015

XDrill®



HM  
MGX



**Rm**  
<850-1500

21

N° B62015 / B63015

Supradrill® U



HM  
MG10



**Rm**  
<850-1100

**Inox**  
Stainless

37

N° B62014 / B63014

Supradrill® U



HM  
MG10



**Rm**  
<850-1100

55

## 3xd

N° B72011

XDrill®



HM  
MGX



**Rm**  
<850-1500

65

N° B52111 / B53111

Supradrill® HX



HM  
XA



**HRC**  
48 - >60

75

N° B62011 / B63011

Supradrill® U



HM  
MG10



**Rm**  
<850-1100

**Inox**  
Stainless

81

## 8xd

N° B72020

XDrill®



HM  
MGX



**Rm**  
<850-1300

85

N° B52020 / B53020

Supradrill® N



HM  
MG10



**Rm**  
<850-1100

95

# Outils de perçage pour acier, l'aluminium, inox et titane

Forets pour perçage profonds

**15xd**

N° B52915



HM  
MGD<sup>2</sup>



Rm  
<850-1100

99

**20xd**

N° B52920



HM  
MGD<sup>2</sup>



Rm  
<850-1100

101

**25xd**

N° B52925



HM  
MGD<sup>2</sup>



Rm  
<850-1100

103

**30xd**

N° B52930



HM  
MGD<sup>2</sup>



Rm  
<850-1100

105

# Outils de perçage pour acier, l'aluminium, inox et titane

Microforets

| 5xd       |               |                                                                                  |            |                                                                                   |                                      |     |
|-----------|---------------|----------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------|--------------------------------------|-----|
| N° B57014 | Microdrill NX |  | HM<br>MG10 |  | Rm<br><850-1100                      | 107 |
| N° B57015 | Microdrill NX |  | HM<br>MG10 |  | Rm<br><850-1100<br>Inox<br>Stainless | 113 |

| 8xd       |               |                                                                                  |            |                                                                                   |                 |     |
|-----------|---------------|----------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------|-----------------|-----|
| N° B57020 | Microdrill NX |  | HM<br>MG10 |  | Rm<br><850-1100 | 117 |

Forets à étages

| 3xd, pour avant-trous de taraudage |  |                                                                                  |    |                                                                                   |                 |     |
|------------------------------------|--|----------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------|-----------------|-----|
| N° B52801                          |  |  | HM |  | Rm<br><850-1100 | 121 |

# Outils de perçage pour CFC, CFC/Matériau composite métallique

Forets hélicoïdaux

| 3xd       |                                                                                  |          |                                                                                   |     |  |     |
|-----------|----------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------|-----|--|-----|
| N° B52710 |  | HM<br>XA |  | CFK |  | 123 |

| 5xd       |                                                                                  |            |                                                                                   |        |        |     |
|-----------|----------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------|--------|--------|-----|
| N° B52724 |  | HM<br>MG10 |  | CFK/Ti | CFK/Al | 125 |

Microforets

| 3xd       |                                                                                  |          |                                                                                   |     |  |     |
|-----------|----------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------|-----|--|-----|
| N° B57710 |  | HM<br>XA |  | CFK |  | 127 |



# Forets à pointer, Fraises coniques

## Forets à pointer

N° B92040



|            |     |                 |  |  |     |
|------------|-----|-----------------|--|--|-----|
| HM<br>MG10 | 90° | Rm<br><850-1100 |  |  | 129 |
|------------|-----|-----------------|--|--|-----|

N° B92020



|            |      |                 |  |  |     |
|------------|------|-----------------|--|--|-----|
| HM<br>MG10 | 120° | Rm<br><850-1100 |  |  | 131 |
|------------|------|-----------------|--|--|-----|

N° B92008



|            |      |                 |  |  |     |
|------------|------|-----------------|--|--|-----|
| HM<br>MG10 | 144° | Rm<br><850-1100 |  |  | 133 |
|------------|------|-----------------|--|--|-----|

## Fraises coniques

N° B92360



|    |     |                 |  |  |     |
|----|-----|-----------------|--|--|-----|
| HM | 90° | Rm<br><850-1100 |  |  | 134 |
|----|-----|-----------------|--|--|-----|

N° B92310 / B92300



|     |     |                 |  |  |     |
|-----|-----|-----------------|--|--|-----|
| HSS | 90° | Rm<br><850-1100 |  |  | 135 |
|-----|-----|-----------------|--|--|-----|

## Application



## Matières

Aciers  
< 500 N/mm²

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm³/min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|----------------|------------|
| 3.00       | 180                       | 0.135     | 19100                     | 2580                       | 18.0           | 0.5        |
| 3.30       | 180                       | 0.145     | 17360                     | 2515                       | 21.5           | 0.5        |
| 3.50       | 180                       | 0.155     | 16370                     | 2535                       | 24.5           | 0.5        |
| 3.80       | 180                       | 0.170     | 15080                     | 2565                       | 29.0           | 0.6        |
| 4.00       | 180                       | 0.185     | 14325                     | 2650                       | 33.5           | 0.6        |
| 4.20       | 180                       | 0.200     | 13640                     | 2730                       | 38.0           | 0.6        |
| 4.50       | 180                       | 0.230     | 12730                     | 2930                       | 46.5           | 0.5        |
| 4.80       | 180                       | 0.245     | 11935                     | 2925                       | 53.0           | 0.7        |
| 5.00       | 180                       | 0.255     | 11460                     | 2920                       | 57.5           | 0.7        |

Aciers  
500 - 850 N/mm²

|      |     |       |       |      |      |     |
|------|-----|-------|-------|------|------|-----|
| 3.00 | 160 | 0.115 | 16975 | 1950 | 14.0 | 0.6 |
| 3.30 | 160 | 0.125 | 15435 | 1930 | 16.5 | 0.6 |
| 3.50 | 160 | 0.135 | 14550 | 1965 | 19.0 | 0.6 |
| 3.80 | 160 | 0.145 | 13405 | 1945 | 22.0 | 0.8 |
| 4.00 | 160 | 0.160 | 12730 | 2035 | 25.5 | 0.8 |
| 4.20 | 160 | 0.170 | 12125 | 2060 | 28.5 | 0.8 |
| 4.50 | 160 | 0.195 | 11320 | 2205 | 35.0 | 0.7 |
| 4.80 | 160 | 0.210 | 10610 | 2230 | 40.5 | 0.9 |
| 5.00 | 160 | 0.215 | 10185 | 2190 | 43.0 | 1.0 |

Aciers  
850 - 1100 N/mm²

|      |     |       |       |      |      |     |
|------|-----|-------|-------|------|------|-----|
| 3.00 | 140 | 0.105 | 14855 | 1560 | 11.0 | 0.8 |
| 3.30 | 140 | 0.115 | 13505 | 1555 | 13.5 | 0.8 |
| 3.50 | 140 | 0.125 | 12730 | 1590 | 15.5 | 0.7 |
| 3.80 | 140 | 0.135 | 11725 | 1585 | 18.0 | 1.0 |
| 4.00 | 140 | 0.145 | 11140 | 1615 | 20.5 | 1.0 |
| 4.20 | 140 | 0.155 | 10610 | 1645 | 23.0 | 1.0 |
| 4.50 | 140 | 0.180 | 9905  | 1785 | 28.5 | 0.9 |
| 4.80 | 140 | 0.190 | 9285  | 1765 | 32.0 | 1.2 |
| 5.00 | 140 | 0.200 | 8915  | 1785 | 35.0 | 1.2 |

Aciers  
1100 - 1300 N/mm²

|      |     |       |       |     |      |     |
|------|-----|-------|-------|-----|------|-----|
| 3.00 | 100 | 0.080 | 10610 | 850 | 6.0  | 1.4 |
| 3.30 | 100 | 0.090 | 9645  | 870 | 7.5  | 1.4 |
| 3.50 | 100 | 0.095 | 9095  | 865 | 8.5  | 1.4 |
| 3.80 | 100 | 0.100 | 8375  | 840 | 9.5  | 2.0 |
| 4.00 | 100 | 0.110 | 7960  | 875 | 11.0 | 1.8 |
| 4.20 | 100 | 0.120 | 7580  | 910 | 12.5 | 1.8 |
| 4.50 | 100 | 0.135 | 7075  | 955 | 15.0 | 1.7 |
| 4.80 | 100 | 0.145 | 6630  | 960 | 17.5 | 2.1 |
| 5.00 | 100 | 0.150 | 6365  | 955 | 19.0 | 2.2 |

## Matières

Aciers  
1300 - 1500 N/mm²

|      |    |       |      |     |     |     |
|------|----|-------|------|-----|-----|-----|
| 3.00 | 55 | 0.060 | 5835 | 350 | 2.5 | 3.5 |
| 3.30 | 55 | 0.070 | 5305 | 370 | 3.0 | 3.2 |
| 3.50 | 55 | 0.070 | 5000 | 350 | 3.5 | 3.4 |
| 3.80 | 55 | 0.080 | 4605 | 370 | 4.0 | 4.4 |
| 4.00 | 55 | 0.085 | 4375 | 370 | 4.5 | 4.4 |
| 4.20 | 55 | 0.090 | 4170 | 375 | 5.0 | 4.3 |
| 4.50 | 55 | 0.105 | 3890 | 410 | 6.5 | 3.9 |
| 4.80 | 55 | 0.110 | 3645 | 400 | 7.0 | 5.1 |
| 5.00 | 55 | 0.115 | 3500 | 405 | 8.0 | 5.1 |

Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]  
Aciers inoxydables  
[Cr-Ni/1.4301]

|      |    |       |      |     |      |     |
|------|----|-------|------|-----|------|-----|
| 3.00 | 70 | 0.060 | 7425 | 445 | 3.0  | 2.7 |
| 3.30 | 70 | 0.070 | 6750 | 475 | 4.0  | 2.5 |
| 3.50 | 70 | 0.070 | 6365 | 445 | 4.5  | 2.7 |
| 3.80 | 70 | 0.080 | 5865 | 470 | 5.5  | 3.5 |
| 4.00 | 70 | 0.085 | 5570 | 475 | 6.0  | 3.4 |
| 4.20 | 70 | 0.090 | 5305 | 475 | 6.5  | 3.4 |
| 4.50 | 70 | 0.105 | 4950 | 520 | 8.5  | 3.1 |
| 4.80 | 70 | 0.110 | 4640 | 510 | 9.0  | 4.0 |
| 5.00 | 70 | 0.115 | 4455 | 510 | 10.0 | 4.1 |

Titanes alliés trempés  
>300 HB  
[Ti6Al4V]

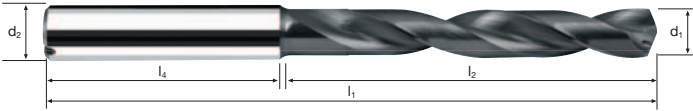
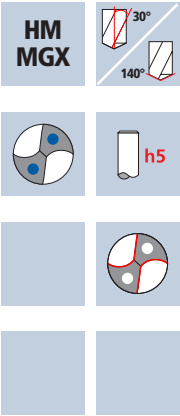
|      |    |       |      |     |     |     |
|------|----|-------|------|-----|-----|-----|
| 3.00 | 40 | 0.060 | 4245 | 255 | 2.0 | 4.8 |
| 3.30 | 40 | 0.070 | 3860 | 270 | 2.5 | 4.4 |
| 3.50 | 40 | 0.070 | 3640 | 255 | 2.5 | 4.6 |
| 3.80 | 40 | 0.080 | 3350 | 270 | 3.0 | 6.1 |
| 4.00 | 40 | 0.085 | 3185 | 270 | 3.5 | 6.0 |
| 4.20 | 40 | 0.090 | 3030 | 275 | 4.0 | 5.8 |
| 4.50 | 40 | 0.105 | 2830 | 295 | 4.5 | 5.4 |
| 4.80 | 40 | 0.110 | 2655 | 290 | 5.0 | 7.1 |
| 5.00 | 40 | 0.115 | 2545 | 295 | 6.0 | 7.1 |

Fonte  
grise / sphéroïdale

|      |     |       |       |      |      |     |
|------|-----|-------|-------|------|------|-----|
| 3.00 | 240 | 0.120 | 25465 | 3055 | 21.5 | 0.4 |
| 3.30 | 240 | 0.135 | 23150 | 3125 | 26.5 | 0.4 |
| 3.50 | 240 | 0.140 | 21825 | 3055 | 29.5 | 0.4 |
| 3.80 | 240 | 0.155 | 20105 | 3115 | 35.5 | 0.5 |
| 4.00 | 240 | 0.165 | 19100 | 3150 | 39.5 | 0.5 |
| 4.20 | 240 | 0.180 | 18190 | 3275 | 45.5 | 0.5 |
| 4.50 | 240 | 0.205 | 16975 | 3480 | 55.5 | 0.5 |
| 4.80 | 240 | 0.220 | 15915 | 3500 | 63.5 | 0.6 |
| 5.00 | 240 | 0.230 | 15280 | 3515 | 69.0 | 0.6 |

# Forets hélicoïdaux XDrill®

5xd



|             |                |                 |                 |              |  |  |                   |                |       |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|

| Exemple: N° cde     |          |          |    |    |    |                  | DURO-X |   |
|---------------------|----------|----------|----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |    |    |    |                  | B72015 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1 | l2 | l4 | L <sub>max</sub> |        |   |
| .0300               | 3.0      | 6        | 66 | 28 | 36 | 20.2             |        | ● |
| .0310               | 3.1      | 6        | 66 | 28 | 36 | 20.2             |        | ● |
| .0320               | 3.2      | 6        | 66 | 28 | 36 | 20.0             |        | ● |
| .0330               | 3.3      | 6        | 66 | 28 | 36 | 20.0             |        | ● |
| .0340               | 3.4      | 6        | 66 | 28 | 36 | 19.8             |        | ● |
| .0350               | 3.5      | 6        | 66 | 28 | 36 | 19.8             |        | ● |
| .0360               | 3.6      | 6        | 66 | 28 | 36 | 19.6             |        | ● |
| .0370               | 3.7      | 6        | 66 | 28 | 36 | 19.6             |        | ● |
| .0380               | 3.8      | 6        | 74 | 36 | 36 | 27.4             |        | ● |
| .0390               | 3.9      | 6        | 74 | 36 | 36 | 27.3             |        | ● |
| .0400               | 4.0      | 6        | 74 | 36 | 36 | 26.9             |        | ● |
| .0410               | 4.1      | 6        | 74 | 36 | 36 | 26.8             |        | ● |
| .0420               | 4.2      | 6        | 74 | 36 | 36 | 26.7             |        | ● |
| .0430               | 4.3      | 6        | 74 | 36 | 36 | 26.7             |        | ● |
| .0440               | 4.4      | 6        | 74 | 36 | 36 | 26.6             |        | ● |
| .0450               | 4.5      | 6        | 74 | 36 | 36 | 26.6             |        | ● |
| .0460               | 4.6      | 6        | 74 | 36 | 36 | 26.5             |        | ● |
| .0470               | 4.7      | 6        | 74 | 36 | 36 | 26.5             |        | ● |
| .0480               | 4.8      | 6        | 82 | 44 | 36 | 34.3             |        | ● |
| .0490               | 4.9      | 6        | 82 | 44 | 36 | 34.3             |        | ● |
| .0500               | 5.0      | 6        | 82 | 44 | 36 | 34.7             |        | ● |
| .0510               | 5.1      | 6        | 82 | 44 | 36 | 34.7             |        | ● |
| .0520               | 5.2      | 6        | 82 | 44 | 36 | 34.6             |        | ● |

## Application



## Matières

Aciers  
< 500 N/mm<sup>2</sup>

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 5.50       | 180                       | 0.280     | 10415                     | 2915                       | 69.5                        | 0.7        |
| 5.80       | 180                       | 0.295     | 9880                      | 2915                       | 77.0                        | 0.7        |
| 6.00       | 180                       | 0.315     | 9550                      | 3010                       | 85.0                        | 0.7        |
| 6.20       | 180                       | 0.335     | 9240                      | 3095                       | 93.5                        | 0.8        |
| 6.50       | 180                       | 0.350     | 8815                      | 3085                       | 102.5                       | 0.8        |
| 6.80       | 180                       | 0.365     | 8425                      | 3075                       | 111.5                       | 0.8        |
| 7.00       | 180                       | 0.380     | 8185                      | 3110                       | 119.5                       | 0.8        |
| 7.20       | 180                       | 0.390     | 7960                      | 3105                       | 126.5                       | 0.8        |
| 7.50       | 180                       | 0.405     | 7640                      | 3095                       | 136.5                       | 0.8        |

Aciers  
500 - 850 N/mm<sup>2</sup>

|      |     |       |      |      |       |     |
|------|-----|-------|------|------|-------|-----|
| 5.50 | 160 | 0.240 | 9260 | 2220 | 52.5  | 0.9 |
| 5.80 | 160 | 0.250 | 8780 | 2195 | 58.0  | 0.9 |
| 6.00 | 160 | 0.270 | 8490 | 2290 | 64.5  | 0.9 |
| 6.20 | 160 | 0.285 | 8215 | 2340 | 70.5  | 1.1 |
| 6.50 | 160 | 0.300 | 7835 | 2350 | 78.0  | 1.0 |
| 6.80 | 160 | 0.315 | 7490 | 2360 | 85.5  | 1.0 |
| 7.00 | 160 | 0.325 | 7275 | 2365 | 91.0  | 1.0 |
| 7.20 | 160 | 0.335 | 7075 | 2370 | 96.5  | 1.0 |
| 7.50 | 160 | 0.345 | 6790 | 2345 | 103.5 | 1.0 |

Aciers  
850 - 1100 N/mm<sup>2</sup>

|      |     |       |      |      |      |     |
|------|-----|-------|------|------|------|-----|
| 5.50 | 140 | 0.220 | 8100 | 1780 | 42.5 | 1.2 |
| 5.80 | 140 | 0.230 | 7685 | 1770 | 47.0 | 1.2 |
| 6.00 | 140 | 0.250 | 7425 | 1855 | 52.5 | 1.1 |
| 6.20 | 140 | 0.265 | 7190 | 1905 | 57.5 | 1.3 |
| 6.50 | 140 | 0.275 | 6855 | 1885 | 62.5 | 1.3 |
| 6.80 | 140 | 0.290 | 6555 | 1900 | 69.0 | 1.3 |
| 7.00 | 140 | 0.300 | 6365 | 1910 | 73.5 | 1.3 |
| 7.20 | 140 | 0.305 | 6190 | 1890 | 77.0 | 1.3 |
| 7.50 | 140 | 0.320 | 5940 | 1900 | 84.0 | 1.3 |

Aciers  
1100 - 1300 N/mm<sup>2</sup>

|      |     |       |      |      |      |     |
|------|-----|-------|------|------|------|-----|
| 5.50 | 100 | 0.165 | 5785 | 955  | 22.5 | 2.2 |
| 5.80 | 100 | 0.175 | 5490 | 960  | 25.5 | 2.1 |
| 6.00 | 100 | 0.190 | 5305 | 1010 | 28.5 | 2.0 |
| 6.20 | 100 | 0.200 | 5135 | 1025 | 31.0 | 2.4 |
| 6.50 | 100 | 0.210 | 4895 | 1030 | 34.0 | 2.4 |
| 6.80 | 100 | 0.220 | 4680 | 1030 | 37.5 | 2.4 |
| 7.00 | 100 | 0.225 | 4545 | 1025 | 39.5 | 2.4 |
| 7.20 | 100 | 0.235 | 4420 | 1040 | 42.5 | 2.3 |
| 7.50 | 100 | 0.245 | 4245 | 1040 | 46.0 | 2.3 |

## Matières

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|      |    |       |      |     |      |     |
|------|----|-------|------|-----|------|-----|
| 5.50 | 55 | 0.130 | 3185 | 415 | 10.0 | 5.0 |
| 5.80 | 55 | 0.135 | 3020 | 410 | 11.0 | 5.0 |
| 6.00 | 55 | 0.145 | 2920 | 425 | 12.0 | 4.8 |
| 6.20 | 55 | 0.155 | 2825 | 440 | 13.5 | 5.6 |
| 6.50 | 55 | 0.160 | 2695 | 430 | 14.5 | 5.7 |
| 6.80 | 55 | 0.170 | 2575 | 440 | 16.0 | 5.6 |
| 7.00 | 55 | 0.175 | 2500 | 440 | 17.0 | 5.6 |
| 7.20 | 55 | 0.180 | 2430 | 435 | 17.5 | 5.6 |
| 7.50 | 55 | 0.185 | 2335 | 430 | 19.0 | 5.6 |

Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]  
Aciers inoxydables  
[Cr-Ni/1.4301]

|      |    |       |      |     |      |     |
|------|----|-------|------|-----|------|-----|
| 5.50 | 70 | 0.130 | 4050 | 525 | 12.5 | 3.9 |
| 5.80 | 70 | 0.135 | 3840 | 520 | 13.5 | 4.0 |
| 6.00 | 70 | 0.145 | 3715 | 540 | 15.5 | 3.8 |
| 6.20 | 70 | 0.155 | 3595 | 555 | 17.0 | 4.5 |
| 6.50 | 70 | 0.160 | 3430 | 550 | 18.5 | 4.5 |
| 6.80 | 70 | 0.170 | 3275 | 555 | 20.0 | 4.4 |
| 7.00 | 70 | 0.175 | 3185 | 555 | 21.5 | 4.4 |
| 7.20 | 70 | 0.180 | 3095 | 555 | 22.5 | 4.4 |
| 7.50 | 70 | 0.185 | 2970 | 550 | 24.5 | 4.4 |

Titanes alliés trempés  
>300 HB  
[Ti6Al4V]

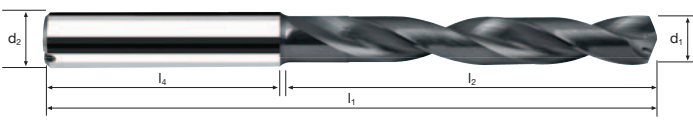
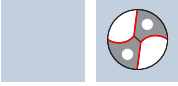
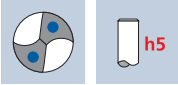
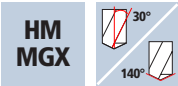
|      |    |       |      |     |      |     |
|------|----|-------|------|-----|------|-----|
| 5.50 | 40 | 0.130 | 2315 | 300 | 7.0  | 6.9 |
| 5.80 | 40 | 0.135 | 2195 | 295 | 8.0  | 7.0 |
| 6.00 | 40 | 0.145 | 2120 | 305 | 8.5  | 6.7 |
| 6.20 | 40 | 0.155 | 2055 | 320 | 9.5  | 7.7 |
| 6.50 | 40 | 0.160 | 1960 | 315 | 10.5 | 7.8 |
| 6.80 | 40 | 0.170 | 1870 | 320 | 11.5 | 7.7 |
| 7.00 | 40 | 0.175 | 1820 | 320 | 12.5 | 7.6 |
| 7.20 | 40 | 0.180 | 1770 | 320 | 13.0 | 7.6 |
| 7.50 | 40 | 0.185 | 1700 | 315 | 14.0 | 7.7 |

Fonte  
grise / sphéroïdale

|      |     |       |       |      |       |     |
|------|-----|-------|-------|------|-------|-----|
| 5.50 | 240 | 0.255 | 13890 | 3540 | 84.0  | 0.6 |
| 5.80 | 240 | 0.265 | 13170 | 3490 | 92.0  | 0.6 |
| 6.00 | 240 | 0.285 | 12730 | 3630 | 102.5 | 0.6 |
| 6.20 | 240 | 0.305 | 12320 | 3760 | 113.5 | 0.7 |
| 6.50 | 240 | 0.320 | 11755 | 3760 | 125.0 | 0.7 |
| 6.80 | 240 | 0.335 | 11235 | 3765 | 136.5 | 0.7 |
| 7.00 | 240 | 0.345 | 10915 | 3765 | 145.0 | 0.6 |
| 7.20 | 240 | 0.355 | 10610 | 3765 | 153.5 | 0.6 |
| 7.50 | 240 | 0.370 | 10185 | 3770 | 166.5 | 0.6 |

# Forets hélicoïdaux XDrill®

5xd



| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|

| Exemple: N° cde     |          |          |    |    |    |                  | DURO-X |   |
|---------------------|----------|----------|----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |    |    |    |                  | B72015 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1 | l2 | l4 | L <sub>max</sub> |        |   |
| .0530               | 5.3      | 6        | 82 | 44 | 36 | 34.6             |        | ● |
| .0540               | 5.4      | 6        | 82 | 44 | 36 | 34.5             |        | ● |
| .0550               | 5.5      | 6        | 82 | 44 | 36 | 34.4             |        | ● |
| .0560               | 5.6      | 6        | 82 | 44 | 36 | 34.3             |        | ● |
| .0570               | 5.7      | 6        | 82 | 44 | 36 | 34.4             |        | ● |
| .0580               | 5.8      | 6        | 82 | 44 | 36 | 34.3             |        | ● |
| .0590               | 5.9      | 6        | 82 | 44 | 36 | 34.3             |        | ● |
| .0600               | 6.0      | 6        | 82 | 44 | 36 | 34.3             |        | ● |
| .0610               | 6.1      | 8        | 91 | 53 | 36 | 41.3             |        | ● |
| .0620               | 6.2      | 8        | 91 | 53 | 36 | 41.2             |        | ● |
| .0630               | 6.3      | 8        | 91 | 53 | 36 | 41.2             |        | ● |
| .0640               | 6.4      | 8        | 91 | 53 | 36 | 41.1             |        | ● |
| .0650               | 6.5      | 8        | 91 | 53 | 36 | 41.0             |        | ● |
| .0660               | 6.6      | 8        | 91 | 53 | 36 | 40.9             |        | ● |
| .0670               | 6.7      | 8        | 91 | 53 | 36 | 40.9             |        | ● |
| .0680               | 6.8      | 8        | 91 | 53 | 36 | 40.8             |        | ● |
| .0690               | 6.9      | 8        | 91 | 53 | 36 | 40.8             |        | ● |
| .0700               | 7.0      | 8        | 91 | 53 | 36 | 40.7             |        | ● |
| .0710               | 7.1      | 8        | 91 | 53 | 36 | 40.7             |        | ● |
| .0720               | 7.2      | 8        | 91 | 53 | 36 | 40.6             |        | ● |
| .0730               | 7.3      | 8        | 91 | 53 | 36 | 40.5             |        | ● |
| .0740               | 7.4      | 8        | 91 | 53 | 36 | 40.4             |        | ● |
| .0750               | 7.5      | 8        | 91 | 53 | 36 | 40.4             |        | ● |



## Application



## Matières

Aciers  
< 500 N/mm<sup>2</sup>

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 7.60       | 180                       | 0.410     | 7540                      | 3090                       | 140.0                       | 0.8        |
| 8.00       | 180                       | 0.430     | 7160                      | 3080                       | 155.0                       | 0.8        |
| 8.20       | 180                       | 0.445     | 6985                      | 3110                       | 164.0                       | 0.9        |
| 8.50       | 180                       | 0.460     | 6740                      | 3100                       | 176.0                       | 0.9        |
| 8.80       | 180                       | 0.475     | 6510                      | 3090                       | 188.0                       | 0.9        |
| 9.00       | 180                       | 0.485     | 6365                      | 3085                       | 196.5                       | 0.9        |
| 9.20       | 180                       | 0.495     | 6230                      | 3085                       | 205.0                       | 0.9        |
| 9.50       | 180                       | 0.515     | 6030                      | 3105                       | 220.0                       | 0.9        |
| 9.80       | 180                       | 0.530     | 5845                      | 3100                       | 234.0                       | 0.9        |

Aciers  
500 - 850 N/mm<sup>2</sup>

|      |     |       |      |      |       |     |
|------|-----|-------|------|------|-------|-----|
| 7.60 | 160 | 0.350 | 6700 | 2345 | 106.5 | 1.0 |
| 8.00 | 160 | 0.370 | 6365 | 2355 | 118.5 | 1.0 |
| 8.20 | 160 | 0.380 | 6210 | 2360 | 124.5 | 1.2 |
| 8.50 | 160 | 0.395 | 5990 | 2365 | 134.0 | 1.2 |
| 8.80 | 160 | 0.405 | 5785 | 2345 | 142.5 | 1.2 |
| 9.00 | 160 | 0.415 | 5660 | 2350 | 149.5 | 1.2 |
| 9.20 | 160 | 0.425 | 5535 | 2350 | 156.0 | 1.2 |
| 9.50 | 160 | 0.440 | 5360 | 2360 | 167.5 | 1.2 |
| 9.80 | 160 | 0.455 | 5195 | 2365 | 178.5 | 1.1 |

Aciers  
850 - 1100 N/mm<sup>2</sup>

|      |     |       |      |      |       |     |
|------|-----|-------|------|------|-------|-----|
| 7.60 | 140 | 0.325 | 5865 | 1905 | 86.5  | 1.3 |
| 8.00 | 140 | 0.340 | 5570 | 1895 | 95.5  | 1.3 |
| 8.20 | 140 | 0.350 | 5435 | 1900 | 100.5 | 1.5 |
| 8.50 | 140 | 0.360 | 5245 | 1890 | 107.0 | 1.5 |
| 8.80 | 140 | 0.375 | 5065 | 1900 | 115.5 | 1.4 |
| 9.00 | 140 | 0.385 | 4950 | 1905 | 121.0 | 1.4 |
| 9.20 | 140 | 0.390 | 4845 | 1890 | 125.5 | 1.4 |
| 9.50 | 140 | 0.405 | 4690 | 1900 | 134.5 | 1.4 |
| 9.80 | 140 | 0.420 | 4545 | 1910 | 144.0 | 1.4 |

Aciers  
1100 - 1300 N/mm<sup>2</sup>

|      |     |       |      |      |      |     |
|------|-----|-------|------|------|------|-----|
| 7.60 | 100 | 0.245 | 4190 | 1025 | 46.5 | 2.4 |
| 8.00 | 100 | 0.260 | 3980 | 1035 | 52.0 | 2.3 |
| 8.20 | 100 | 0.265 | 3880 | 1030 | 54.5 | 2.7 |
| 8.50 | 100 | 0.275 | 3745 | 1030 | 58.5 | 2.7 |
| 8.80 | 100 | 0.285 | 3615 | 1030 | 62.5 | 2.7 |
| 9.00 | 100 | 0.290 | 3535 | 1025 | 65.0 | 2.7 |
| 9.20 | 100 | 0.300 | 3460 | 1040 | 69.0 | 2.6 |
| 9.50 | 100 | 0.310 | 3350 | 1040 | 73.5 | 2.6 |
| 9.80 | 100 | 0.320 | 3250 | 1040 | 78.5 | 2.6 |

## Matières

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|      |    |       |      |     |      |     |
|------|----|-------|------|-----|------|-----|
| 7.60 | 55 | 0.190 | 2305 | 440 | 20.0 | 5.5 |
| 8.00 | 55 | 0.200 | 2190 | 440 | 22.0 | 5.5 |
| 8.20 | 55 | 0.205 | 2135 | 440 | 23.0 | 6.3 |
| 8.50 | 55 | 0.210 | 2060 | 435 | 24.5 | 6.3 |
| 8.80 | 55 | 0.220 | 1990 | 440 | 27.0 | 6.2 |
| 9.00 | 55 | 0.225 | 1945 | 440 | 28.0 | 6.2 |
| 9.20 | 55 | 0.230 | 1905 | 440 | 29.0 | 6.2 |
| 9.50 | 55 | 0.235 | 1845 | 435 | 31.0 | 6.3 |
| 9.80 | 55 | 0.245 | 1785 | 435 | 33.0 | 6.2 |

Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]  
Aciers inoxydables  
[Cr-Ni/1.4301]

|      |    |       |      |     |      |     |
|------|----|-------|------|-----|------|-----|
| 7.60 | 70 | 0.190 | 2930 | 555 | 25.0 | 4.4 |
| 8.00 | 70 | 0.200 | 2785 | 555 | 28.0 | 4.4 |
| 8.20 | 70 | 0.205 | 2715 | 555 | 29.5 | 5.0 |
| 8.50 | 70 | 0.210 | 2620 | 550 | 31.0 | 5.0 |
| 8.80 | 70 | 0.220 | 2530 | 555 | 34.0 | 5.0 |
| 9.00 | 70 | 0.225 | 2475 | 555 | 35.5 | 4.9 |
| 9.20 | 70 | 0.230 | 2420 | 555 | 37.0 | 4.9 |
| 9.50 | 70 | 0.235 | 2345 | 550 | 39.0 | 4.9 |
| 9.80 | 70 | 0.245 | 2275 | 555 | 42.0 | 4.9 |

Titanes alliés trempés  
>300 HB  
[Ti6Al4V]

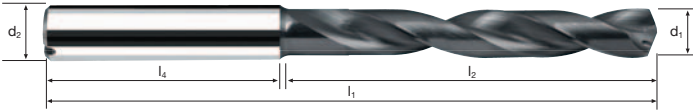
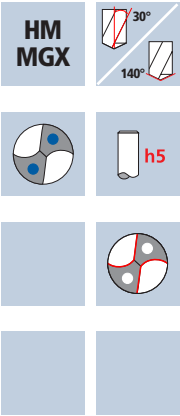
|      |    |       |      |     |      |     |
|------|----|-------|------|-----|------|-----|
| 7.60 | 40 | 0.190 | 1675 | 320 | 14.5 | 7.6 |
| 8.00 | 40 | 0.200 | 1590 | 320 | 16.0 | 7.6 |
| 8.20 | 40 | 0.205 | 1555 | 320 | 17.0 | 8.7 |
| 8.50 | 40 | 0.210 | 1500 | 315 | 18.0 | 8.8 |
| 8.80 | 40 | 0.220 | 1445 | 320 | 19.5 | 8.6 |
| 9.00 | 40 | 0.225 | 1415 | 320 | 20.5 | 8.6 |
| 9.20 | 40 | 0.230 | 1385 | 320 | 21.5 | 8.5 |
| 9.50 | 40 | 0.235 | 1340 | 315 | 22.5 | 8.6 |
| 9.80 | 40 | 0.245 | 1300 | 320 | 24.0 | 8.5 |

Fonte  
grise / sphéroïdale

|      |     |       |       |      |       |     |
|------|-----|-------|-------|------|-------|-----|
| 7.60 | 240 | 0.375 | 10050 | 3770 | 171.0 | 0.6 |
| 8.00 | 240 | 0.395 | 9550  | 3770 | 189.5 | 0.6 |
| 8.20 | 240 | 0.405 | 9315  | 3775 | 199.5 | 0.7 |
| 8.50 | 240 | 0.415 | 8990  | 3730 | 211.5 | 0.7 |
| 8.80 | 240 | 0.430 | 8680  | 3730 | 227.0 | 0.7 |
| 9.00 | 240 | 0.440 | 8490  | 3735 | 237.5 | 0.7 |
| 9.20 | 240 | 0.450 | 8305  | 3735 | 248.5 | 0.7 |
| 9.50 | 240 | 0.465 | 8040  | 3740 | 265.0 | 0.7 |
| 9.80 | 240 | 0.480 | 7795  | 3740 | 282.0 | 0.7 |

# Forets hélicoïdaux XDrill®

5xd



|             |                |                 |                 |              |  |  |                   |                |       |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|

| Exemple: N° cde     |          |          |     |    |    |                  | DURO-X |   |
|---------------------|----------|----------|-----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | B72015 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1  | l2 | l4 | L <sub>max</sub> |        |   |
| .0760               | 7.6      | 8        | 91  | 53 | 36 | 40.3             |        | ● |
| .0770               | 7.7      | 8        | 91  | 53 | 36 | 40.3             |        | ● |
| .0780               | 7.8      | 8        | 91  | 53 | 36 | 40.3             |        | ● |
| .0790               | 7.9      | 8        | 91  | 53 | 36 | 40.3             |        | ● |
| .0800               | 8.0      | 8        | 91  | 53 | 36 | 40.3             |        | ● |
| .0810               | 8.1      | 10       | 103 | 61 | 40 | 46.3             |        | ● |
| .0820               | 8.2      | 10       | 103 | 61 | 40 | 46.2             |        | ● |
| .0830               | 8.3      | 10       | 103 | 61 | 40 | 46.2             |        | ● |
| .0840               | 8.4      | 10       | 103 | 61 | 40 | 46.0             |        | ● |
| .0850               | 8.5      | 10       | 103 | 61 | 40 | 46.0             |        | ● |
| .0860               | 8.6      | 10       | 103 | 61 | 40 | 45.9             |        | ● |
| .0870               | 8.7      | 10       | 103 | 61 | 40 | 45.9             |        | ● |
| .0880               | 8.8      | 10       | 103 | 61 | 40 | 45.8             |        | ● |
| .0890               | 8.9      | 10       | 103 | 61 | 40 | 45.8             |        | ● |
| .0900               | 9.0      | 10       | 103 | 61 | 40 | 45.7             |        | ● |
| .0910               | 9.1      | 10       | 103 | 61 | 40 | 45.6             |        | ● |
| .0920               | 9.2      | 10       | 103 | 61 | 40 | 45.5             |        | ● |
| .0930               | 9.3      | 10       | 103 | 61 | 40 | 45.5             |        | ● |
| .0940               | 9.4      | 10       | 103 | 61 | 40 | 45.4             |        | ● |
| .0950               | 9.5      | 10       | 103 | 61 | 40 | 45.4             |        | ● |
| .0960               | 9.6      | 10       | 103 | 61 | 40 | 45.3             |        | ● |
| .0970               | 9.7      | 10       | 103 | 61 | 40 | 45.3             |        | ● |
| .0980               | 9.8      | 10       | 103 | 61 | 40 | 45.2             |        | ● |

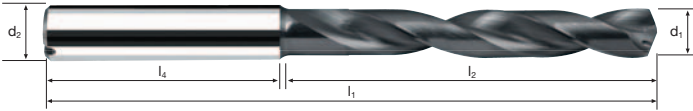
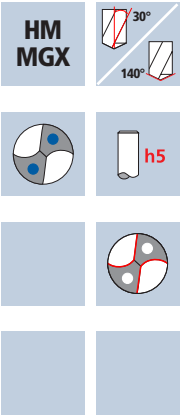
| Application                                                                       | Matières                                | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>       | 10.00      | 180                       | 0.540     | 5730                      | 3095                       | 243.0                       | 0.9        |
|                                                                                   |                                         | 10.20      | 180                       | 0.545     | 5615                      | 3060                       | 250.0                       | 1.0        |
|                                                                                   |                                         | 10.50      | 180                       | 0.565     | 5455                      | 3080                       | 266.5                       | 1.0        |
|                                                                                   |                                         | 10.80      | 180                       | 0.575     | 5305                      | 3050                       | 279.5                       | 1.0        |
|                                                                                   |                                         | 11.00      | 180                       | 0.585     | 5210                      | 3050                       | 290.0                       | 1.0        |
|                                                                                   |                                         | 11.20      | 180                       | 0.585     | 5115                      | 2990                       | 294.5                       | 1.1        |
|                                                                                   |                                         | 11.50      | 180                       | 0.590     | 4980                      | 2940                       | 305.5                       | 1.1        |
|                                                                                   |                                         | 11.80      | 180                       | 0.600     | 4855                      | 2915                       | 319.0                       | 1.1        |
|                                                                                   |                                         | 12.00      | 180                       | 0.610     | 4775                      | 2915                       | 329.5                       | 1.1        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm <sup>2</sup>   | 10.00      | 160                       | 0.465     | 5095                      | 2370                       | 186.0                       | 1.1        |
|                                                                                   |                                         | 10.20      | 160                       | 0.470     | 4995                      | 2350                       | 192.0                       | 1.4        |
|                                                                                   |                                         | 10.50      | 160                       | 0.485     | 4850                      | 2350                       | 203.5                       | 1.4        |
|                                                                                   |                                         | 10.80      | 160                       | 0.495     | 4715                      | 2335                       | 214.0                       | 1.4        |
|                                                                                   |                                         | 11.00      | 160                       | 0.500     | 4630                      | 2315                       | 220.0                       | 1.4        |
|                                                                                   |                                         | 11.20      | 160                       | 0.500     | 4545                      | 2275                       | 224.0                       | 1.4        |
|                                                                                   |                                         | 11.50      | 160                       | 0.505     | 4430                      | 2235                       | 232.0                       | 1.4        |
|                                                                                   |                                         | 11.80      | 160                       | 0.510     | 4315                      | 2200                       | 240.5                       | 1.4        |
|                                                                                   |                                         | 12.00      | 160                       | 0.520     | 4245                      | 2205                       | 249.5                       | 1.4        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | 10.00      | 140                       | 0.425     | 4455                      | 1895                       | 149.0                       | 1.4        |
|                                                                                   |                                         | 10.20      | 140                       | 0.430     | 4370                      | 1880                       | 153.5                       | 1.7        |
|                                                                                   |                                         | 10.50      | 140                       | 0.445     | 4245                      | 1890                       | 163.5                       | 1.7        |
|                                                                                   |                                         | 10.80      | 140                       | 0.455     | 4125                      | 1875                       | 172.0                       | 1.7        |
|                                                                                   |                                         | 11.00      | 140                       | 0.460     | 4050                      | 1865                       | 177.0                       | 1.7        |
|                                                                                   |                                         | 11.20      | 140                       | 0.465     | 3980                      | 1850                       | 182.5                       | 1.7        |
|                                                                                   |                                         | 11.50      | 140                       | 0.465     | 3875                      | 1800                       | 187.0                       | 1.7        |
|                                                                                   |                                         | 11.80      | 140                       | 0.470     | 3775                      | 1775                       | 194.0                       | 1.8        |
|                                                                                   |                                         | 12.00      | 140                       | 0.480     | 3715                      | 1785                       | 202.0                       | 1.8        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm <sup>2</sup> | 10.00      | 100                       | 0.325     | 3185                      | 1035                       | 81.5                        | 2.6        |
|                                                                                   |                                         | 10.20      | 100                       | 0.330     | 3120                      | 1030                       | 84.0                        | 3.1        |
|                                                                                   |                                         | 10.50      | 100                       | 0.340     | 3030                      | 1030                       | 89.0                        | 3.1        |
|                                                                                   |                                         | 10.80      | 100                       | 0.345     | 2945                      | 1015                       | 93.0                        | 3.1        |
|                                                                                   |                                         | 11.00      | 100                       | 0.350     | 2895                      | 1015                       | 96.5                        | 3.1        |
|                                                                                   |                                         | 11.20      | 100                       | 0.350     | 2840                      | 995                        | 98.0                        | 3.2        |
|                                                                                   |                                         | 11.50      | 100                       | 0.355     | 2770                      | 985                        | 102.5                       | 3.2        |
|                                                                                   |                                         | 11.80      | 100                       | 0.360     | 2700                      | 970                        | 106.0                       | 3.2        |
|                                                                                   |                                         | 12.00      | 100                       | 0.365     | 2655                      | 970                        | 109.5                       | 3.2        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm <sup>2</sup>                                                                                | 10.00      | 55                        | 0.250     | 1750                      | 440                        | 34.5                        | 6.2        |
|                                                                                                                        | 10.20      | 55                        | 0.255     | 1715                      | 435                        | 35.5                        | 7.3        |
|                                                                                                                        | 10.50      | 55                        | 0.260     | 1665                      | 435                        | 37.5                        | 7.3        |
|                                                                                                                        | 10.80      | 55                        | 0.265     | 1620                      | 430                        | 39.5                        | 7.4        |
|                                                                                                                        | 11.00      | 55                        | 0.270     | 1590                      | 430                        | 41.0                        | 7.3        |
|                                                                                                                        | 11.20      | 55                        | 0.270     | 1565                      | 425                        | 42.0                        | 7.4        |
|                                                                                                                        | 11.50      | 55                        | 0.270     | 1520                      | 410                        | 42.5                        | 7.7        |
|                                                                                                                        | 11.80      | 55                        | 0.275     | 1485                      | 410                        | 45.0                        | 7.6        |
|                                                                                                                        | 12.00      | 55                        | 0.280     | 1460                      | 410                        | 46.5                        | 7.6        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 10.00      | 70                        | 0.250     | 2230                      | 560                        | 44.0                        | 4.8        |
|                                                                                                                        | 10.20      | 70                        | 0.255     | 2185                      | 555                        | 45.5                        | 5.7        |
|                                                                                                                        | 10.50      | 70                        | 0.260     | 2120                      | 550                        | 47.5                        | 5.8        |
|                                                                                                                        | 10.80      | 70                        | 0.265     | 2065                      | 545                        | 50.0                        | 5.8        |
|                                                                                                                        | 11.00      | 70                        | 0.270     | 2025                      | 545                        | 52.0                        | 5.8        |
|                                                                                                                        | 11.20      | 70                        | 0.270     | 1990                      | 535                        | 52.5                        | 5.9        |
|                                                                                                                        | 11.50      | 70                        | 0.270     | 1940                      | 525                        | 54.5                        | 6.0        |
|                                                                                                                        | 11.80      | 70                        | 0.275     | 1890                      | 520                        | 57.0                        | 6.0        |
|                                                                                                                        | 12.00      | 70                        | 0.280     | 1855                      | 520                        | 59.0                        | 6.0        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Titanes alliés trempés<br>>300 HB<br>[Ti6Al4V]                                                                         | 10.00      | 40                        | 0.250     | 1275                      | 320                        | 25.0                        | 8.5        |
|                                                                                                                        | 10.20      | 40                        | 0.255     | 1250                      | 320                        | 26.0                        | 10.0       |
|                                                                                                                        | 10.50      | 40                        | 0.260     | 1215                      | 315                        | 27.5                        | 10.1       |
|                                                                                                                        | 10.80      | 40                        | 0.265     | 1180                      | 315                        | 29.0                        | 10.1       |
|                                                                                                                        | 11.00      | 40                        | 0.270     | 1155                      | 310                        | 29.5                        | 10.2       |
|                                                                                                                        | 11.20      | 40                        | 0.270     | 1135                      | 305                        | 30.0                        | 10.3       |
|                                                                                                                        | 11.50      | 40                        | 0.270     | 1105                      | 300                        | 31.0                        | 10.5       |
|                                                                                                                        | 11.80      | 40                        | 0.275     | 1080                      | 295                        | 32.5                        | 10.6       |
|                                                                                                                        | 12.00      | 40                        | 0.280     | 1060                      | 295                        | 33.5                        | 10.6       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 10.00      | 240                       | 0.490     | 7640                      | 3745                       | 294.0                       | 0.7        |
|                                                                                                                        | 10.20      | 240                       | 0.500     | 7490                      | 3745                       | 306.0                       | 0.9        |
|                                                                                                                        | 10.50      | 240                       | 0.510     | 7275                      | 3710                       | 321.0                       | 0.9        |
|                                                                                                                        | 10.80      | 240                       | 0.525     | 7075                      | 3715                       | 340.5                       | 0.9        |
|                                                                                                                        | 11.00      | 240                       | 0.530     | 6945                      | 3680                       | 349.5                       | 0.9        |
|                                                                                                                        | 11.20      | 240                       | 0.535     | 6820                      | 3650                       | 359.5                       | 0.9        |
|                                                                                                                        | 11.50      | 240                       | 0.535     | 6645                      | 3555                       | 369.5                       | 0.9        |
|                                                                                                                        | 11.80      | 240                       | 0.545     | 6475                      | 3530                       | 386.0                       | 0.9        |
|                                                                                                                        | 12.00      | 240                       | 0.555     | 6365                      | 3535                       | 400.0                       | 0.9        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

Forets hélicoïdaux XDrill®

5xd



|             |                |                 |                 |              |  |  |                   |                |       |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|

| Exemple: N° cde     |          |          |     |    |    |                  | DURO-X |   |
|---------------------|----------|----------|-----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | B72015 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1  | l2 | l4 | L <sub>max</sub> |        |   |
| .0990               | 9.9      | 10       | 103 | 61 | 40 | 45.3             |        | ● |
| .1000               | 10.0     | 10       | 103 | 61 | 40 | 45.2             |        | ● |
| .1010               | 10.1     | 12       | 118 | 71 | 45 | 53.2             |        | ● |
| .1020               | 10.2     | 12       | 118 | 71 | 45 | 53.1             |        | ● |
| .1030               | 10.3     | 12       | 118 | 71 | 45 | 53.1             |        | ● |
| .1040               | 10.4     | 12       | 118 | 71 | 45 | 53.0             |        | ● |
| .1050               | 10.5     | 12       | 118 | 71 | 45 | 53.0             |        | ● |
| .1060               | 10.6     | 12       | 118 | 71 | 45 | 52.9             |        | ● |
| .1070               | 10.7     | 12       | 118 | 71 | 45 | 52.9             |        | ● |
| .1080               | 10.8     | 12       | 118 | 71 | 45 | 52.8             |        | ● |
| .1090               | 10.9     | 12       | 118 | 71 | 45 | 52.7             |        | ● |
| .1100               | 11.0     | 12       | 118 | 71 | 45 | 52.6             |        | ● |
| .1110               | 11.1     | 12       | 118 | 71 | 45 | 52.6             |        | ● |
| .1120               | 11.2     | 12       | 118 | 71 | 45 | 52.5             |        | ● |
| .1130               | 11.3     | 12       | 118 | 71 | 45 | 52.5             |        | ● |
| .1140               | 11.4     | 12       | 118 | 71 | 45 | 52.4             |        | ● |
| .1150               | 11.5     | 12       | 118 | 71 | 45 | 52.4             |        | ● |
| .1160               | 11.6     | 12       | 118 | 71 | 45 | 52.3             |        | ● |
| .1170               | 11.7     | 12       | 118 | 71 | 45 | 52.3             |        | ● |
| .1180               | 11.8     | 12       | 118 | 71 | 45 | 52.2             |        | ● |
| .1190               | 11.9     | 12       | 118 | 71 | 45 | 52.2             |        | ● |
| .1200               | 12.0     | 12       | 118 | 71 | 45 | 52.2             |        | ● |

## Application

## Matières



**Aciers**  
**< 500 N/mm<sup>2</sup>**

Aciers  
500 - 850 N/mm<sup>2</sup>

**Aciers**  
850 - 1100 N/mm<sup>2</sup>

**Aciers**  
1100 - 1300 N/mm<sup>2</sup>

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 12.20      | 180                       | 0.620     | 4695                      | 2910                       | 340.0                       | 1.2        |
| 12.50      | 180                       | 0.635     | 4585                      | 2910                       | 357.0                       | 1.2        |
| 12.60      | 180                       | 0.640     | 4545                      | 2910                       | 363.0                       | 1.2        |
| 12.80      | 180                       | 0.650     | 4475                      | 2910                       | 374.5                       | 1.1        |
| 13.00      | 180                       | 0.660     | 4405                      | 2905                       | 385.5                       | 1.1        |
| 13.20      | 180                       | 0.670     | 4340                      | 2910                       | 398.0                       | 1.1        |
| 13.50      | 180                       | 0.675     | 4245                      | 2865                       | 410.0                       | 1.2        |
| 13.80      | 180                       | 0.675     | 4150                      | 2800                       | 419.0                       | 1.2        |
| 14.00      | 180                       | 0.680     | 4095                      | 2785                       | 428.5                       | 1.2        |
| 12.20      | 160                       | 0.530     | 4175                      | 2215                       | 259.0                       | 1.5        |
| 12.50      | 160                       | 0.545     | 4075                      | 2220                       | 272.5                       | 1.5        |
| 12.60      | 160                       | 0.545     | 4040                      | 2200                       | 274.5                       | 1.5        |
| 12.80      | 160                       | 0.555     | 3980                      | 2210                       | 284.5                       | 1.5        |
| 13.00      | 160                       | 0.565     | 3920                      | 2215                       | 294.0                       | 1.5        |
| 13.20      | 160                       | 0.575     | 3860                      | 2220                       | 304.0                       | 1.5        |
| 13.50      | 160                       | 0.580     | 3775                      | 2190                       | 313.5                       | 1.5        |
| 13.80      | 160                       | 0.580     | 3690                      | 2140                       | 320.0                       | 1.5        |
| 14.00      | 160                       | 0.585     | 3640                      | 2130                       | 328.0                       | 1.6        |
| 12.20      | 140                       | 0.490     | 3655                      | 1790                       | 209.0                       | 1.9        |
| 12.50      | 140                       | 0.500     | 3565                      | 1785                       | 219.0                       | 1.9        |
| 12.60      | 140                       | 0.505     | 3535                      | 1785                       | 222.5                       | 1.9        |
| 12.80      | 140                       | 0.510     | 3480                      | 1775                       | 228.5                       | 1.9        |
| 13.00      | 140                       | 0.520     | 3430                      | 1785                       | 237.0                       | 1.9        |
| 13.20      | 140                       | 0.530     | 3375                      | 1790                       | 245.0                       | 1.9        |
| 13.50      | 140                       | 0.535     | 3300                      | 1765                       | 252.5                       | 1.9        |
| 13.80      | 140                       | 0.535     | 3230                      | 1730                       | 259.0                       | 1.9        |
| 14.00      | 140                       | 0.540     | 3185                      | 1720                       | 265.0                       | 1.9        |
| 12.20      | 100                       | 0.370     | 2610                      | 965                        | 113.0                       | 3.5        |
| 12.50      | 100                       | 0.380     | 2545                      | 965                        | 118.5                       | 3.5        |
| 12.60      | 100                       | 0.385     | 2525                      | 970                        | 121.0                       | 3.5        |
| 12.80      | 100                       | 0.390     | 2485                      | 970                        | 125.0                       | 3.4        |
| 13.00      | 100                       | 0.395     | 2450                      | 970                        | 129.0                       | 3.4        |
| 13.20      | 100                       | 0.400     | 2410                      | 965                        | 132.0                       | 3.5        |
| 13.50      | 100                       | 0.405     | 2360                      | 955                        | 136.5                       | 3.5        |
| 13.80      | 100                       | 0.405     | 2305                      | 935                        | 140.0                       | 3.5        |
| 14.00      | 100                       | 0.410     | 2275                      | 935                        | 144.0                       | 3.5        |

## Matières

Matières

Aciers  
1300 - 1500 N/mm<sup>2</sup>

**Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]  
Aciers inoxydables  
[Cr-Ni/1.4301]**

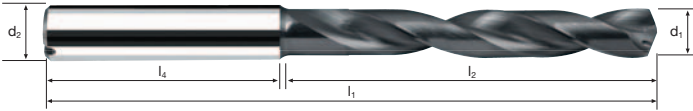
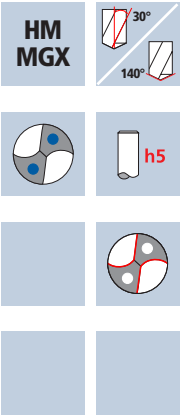
**Titanes alliés trempés**  
**>300 HB**  
**[Ti6Al4V]**

Fonte  
grise / sphéroïdale

| d <sub>1</sub><br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 12.20                  | 55                        | 0.285     | 1435                      | 410                        | 48.0                        | 8.2        |
| 12.50                  | 55                        | 0.290     | 1400                      | 405                        | 49.5                        | 8.3        |
| 12.60                  | 55                        | 0.295     | 1390                      | 410                        | 51.0                        | 8.2        |
| 12.80                  | 55                        | 0.300     | 1370                      | 410                        | 53.0                        | 8.2        |
| 13.00                  | 55                        | 0.305     | 1345                      | 410                        | 54.5                        | 8.1        |
| 13.20                  | 55                        | 0.310     | 1325                      | 410                        | 56.0                        | 8.1        |
| 13.50                  | 55                        | 0.310     | 1295                      | 400                        | 57.5                        | 8.3        |
| 13.80                  | 55                        | 0.310     | 1270                      | 395                        | 59.0                        | 8.4        |
| 14.00                  | 55                        | 0.315     | 1250                      | 395                        | 61.0                        | 8.4        |
| 12.20                  | 70                        | 0.285     | 1825                      | 520                        | 61.0                        | 6.5        |
| 12.50                  | 70                        | 0.290     | 1785                      | 520                        | 64.0                        | 6.5        |
| 12.60                  | 70                        | 0.295     | 1770                      | 520                        | 65.0                        | 6.5        |
| 12.80                  | 70                        | 0.300     | 1740                      | 520                        | 67.0                        | 6.4        |
| 13.00                  | 70                        | 0.305     | 1715                      | 525                        | 69.5                        | 6.4        |
| 13.20                  | 70                        | 0.310     | 1690                      | 525                        | 72.0                        | 6.3        |
| 13.50                  | 70                        | 0.310     | 1650                      | 510                        | 73.0                        | 6.5        |
| 13.80                  | 70                        | 0.310     | 1615                      | 500                        | 75.0                        | 6.6        |
| 14.00                  | 70                        | 0.315     | 1590                      | 500                        | 77.0                        | 6.6        |
| 12.20                  | 40                        | 0.285     | 1045                      | 300                        | 35.0                        | 11.2       |
| 12.50                  | 40                        | 0.290     | 1020                      | 295                        | 36.0                        | 11.4       |
| 12.60                  | 40                        | 0.295     | 1010                      | 300                        | 37.5                        | 11.2       |
| 12.80                  | 40                        | 0.300     | 995                       | 300                        | 38.5                        | 11.1       |
| 13.00                  | 40                        | 0.305     | 980                       | 300                        | 40.0                        | 11.1       |
| 13.20                  | 40                        | 0.310     | 965                       | 300                        | 41.0                        | 11.1       |
| 13.50                  | 40                        | 0.310     | 945                       | 295                        | 42.0                        | 11.2       |
| 13.80                  | 40                        | 0.310     | 925                       | 285                        | 42.5                        | 11.6       |
| 14.00                  | 40                        | 0.315     | 910                       | 285                        | 44.0                        | 11.6       |
| 12.20                  | 240                       | 0.560     | 6260                      | 3505                       | 409.5                       | 1.0        |
| 12.50                  | 240                       | 0.575     | 6110                      | 3515                       | 431.5                       | 1.0        |
| 12.60                  | 240                       | 0.580     | 6065                      | 3520                       | 439.0                       | 1.0        |
| 12.80                  | 240                       | 0.590     | 5970                      | 3520                       | 453.0                       | 0.9        |
| 13.00                  | 240                       | 0.600     | 5875                      | 3525                       | 468.0                       | 0.9        |
| 13.20                  | 240                       | 0.610     | 5785                      | 3530                       | 483.0                       | 0.9        |
| 13.50                  | 240                       | 0.615     | 5660                      | 3480                       | 498.0                       | 1.0        |
| 13.80                  | 240                       | 0.615     | 5535                      | 3405                       | 509.5                       | 1.0        |
| 14.00                  | 240                       | 0.620     | 5455                      | 3380                       | 520.5                       | 1.0        |

Forets hélicoïdaux XDrill®

5xd



|             |                |                 |                 |              |  |  |                   |                |       |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|

| Exemple: N° cde     |          |          |     |    |    |                  | DURO-X |   |
|---------------------|----------|----------|-----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | B72015 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1  | l2 | l4 | L <sub>max</sub> |        |   |
| .1210               | 12.1     | 14       | 124 | 77 | 45 | 56.2             |        | ● |
| .1220               | 12.2     | 14       | 124 | 77 | 45 | 56.1             |        | ● |
| .1230               | 12.3     | 14       | 124 | 77 | 45 | 56.1             |        | ● |
| .1240               | 12.4     | 14       | 124 | 77 | 45 | 56.0             |        | ● |
| .1250               | 12.5     | 14       | 124 | 77 | 45 | 56.0             |        | ● |
| .1260               | 12.6     | 14       | 124 | 77 | 45 | 55.9             |        | ● |
| .1270               | 12.7     | 14       | 124 | 77 | 45 | 55.8             |        | ● |
| .1280               | 12.8     | 14       | 124 | 77 | 45 | 55.7             |        | ● |
| .1290               | 12.9     | 14       | 124 | 77 | 45 | 55.7             |        | ● |
| .1300               | 13.0     | 14       | 124 | 77 | 45 | 55.6             |        | ● |
| .1310               | 13.1     | 14       | 124 | 77 | 45 | 55.6             |        | ● |
| .1320               | 13.2     | 14       | 124 | 77 | 45 | 55.5             |        | ● |
| .1330               | 13.3     | 14       | 124 | 77 | 45 | 55.5             |        | ● |
| .1340               | 13.4     | 14       | 124 | 77 | 45 | 55.4             |        | ● |
| .1350               | 13.5     | 14       | 124 | 77 | 45 | 55.3             |        | ● |
| .1360               | 13.6     | 14       | 124 | 77 | 45 | 55.2             |        | ● |
| .1370               | 13.7     | 14       | 124 | 77 | 45 | 55.2             |        | ● |
| .1380               | 13.8     | 14       | 124 | 77 | 45 | 55.1             |        | ● |
| .1390               | 13.9     | 14       | 124 | 77 | 45 | 55.2             |        | ● |
| .1400               | 14.0     | 14       | 124 | 77 | 45 | 55.1             |        | ● |
|                     |          |          |     |    |    |                  |        |   |
|                     |          |          |     |    |    |                  |        |   |
|                     |          |          |     |    |    |                  |        |   |

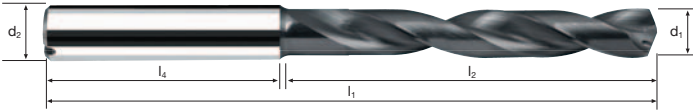
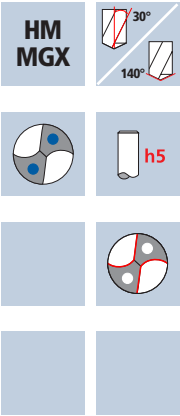


| Application                                                                       | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²       | 14.20      | 180                       | 0.685     | 4035                      | 2765                       | 438.0                       | 1.3        |
|                                                                                   |                             | 14.50      | 180                       | 0.690     | 3950                      | 2725                       | 450.0                       | 1.3        |
|                                                                                   |                             | 14.80      | 180                       | 0.700     | 3870                      | 2710                       | 466.0                       | 1.3        |
|                                                                                   |                             | 15.00      | 180                       | 0.710     | 3820                      | 2710                       | 479.0                       | 1.3        |
|                                                                                   |                             | 15.20      | 180                       | 0.720     | 3770                      | 2715                       | 492.5                       | 1.3        |
|                                                                                   |                             | 15.50      | 180                       | 0.725     | 3695                      | 2680                       | 505.5                       | 1.3        |
|                                                                                   |                             | 15.70      | 180                       | 0.725     | 3650                      | 2645                       | 512.0                       | 1.3        |
|                                                                                   |                             | 15.80      | 180                       | 0.730     | 3625                      | 2645                       | 518.5                       | 1.3        |
|                                                                                   |                             | 16.00      | 180                       | 0.735     | 3580                      | 2630                       | 529.0                       | 1.3        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm²   | 14.20      | 160                       | 0.590     | 3585                      | 2115                       | 335.0                       | 1.7        |
|                                                                                   |                             | 14.50      | 160                       | 0.590     | 3510                      | 2070                       | 342.0                       | 1.7        |
|                                                                                   |                             | 14.80      | 160                       | 0.600     | 3440                      | 2065                       | 355.0                       | 1.7        |
|                                                                                   |                             | 15.00      | 160                       | 0.610     | 3395                      | 2070                       | 366.0                       | 1.7        |
|                                                                                   |                             | 15.20      | 160                       | 0.615     | 3350                      | 2060                       | 374.0                       | 1.7        |
|                                                                                   |                             | 15.50      | 160                       | 0.620     | 3285                      | 2035                       | 384.0                       | 1.7        |
|                                                                                   |                             | 15.70      | 160                       | 0.625     | 3245                      | 2030                       | 393.0                       | 1.7        |
|                                                                                   |                             | 15.80      | 160                       | 0.625     | 3225                      | 2015                       | 395.0                       | 1.7        |
|                                                                                   |                             | 16.00      | 160                       | 0.630     | 3185                      | 2005                       | 403.0                       | 1.7        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | 14.20      | 140                       | 0.540     | 3140                      | 1695                       | 268.5                       | 2.1        |
|                                                                                   |                             | 14.50      | 140                       | 0.545     | 3075                      | 1675                       | 276.5                       | 2.1        |
|                                                                                   |                             | 14.80      | 140                       | 0.555     | 3010                      | 1670                       | 287.5                       | 2.1        |
|                                                                                   |                             | 15.00      | 140                       | 0.560     | 2970                      | 1665                       | 294.0                       | 2.1        |
|                                                                                   |                             | 15.20      | 140                       | 0.570     | 2930                      | 1670                       | 303.0                       | 2.1        |
|                                                                                   |                             | 15.50      | 140                       | 0.570     | 2875                      | 1640                       | 309.5                       | 2.1        |
|                                                                                   |                             | 15.70      | 140                       | 0.575     | 2840                      | 1635                       | 316.5                       | 2.1        |
|                                                                                   |                             | 15.80      | 140                       | 0.580     | 2820                      | 1635                       | 320.5                       | 2.1        |
|                                                                                   |                             | 16.00      | 140                       | 0.580     | 2785                      | 1615                       | 324.5                       | 2.2        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm² | 14.20      | 100                       | 0.410     | 2240                      | 920                        | 145.5                       | 3.9        |
|                                                                                   |                             | 14.50      | 100                       | 0.415     | 2195                      | 910                        | 150.5                       | 3.9        |
|                                                                                   |                             | 14.80      | 100                       | 0.420     | 2150                      | 905                        | 155.5                       | 3.9        |
|                                                                                   |                             | 15.00      | 100                       | 0.425     | 2120                      | 900                        | 159.0                       | 3.9        |
|                                                                                   |                             | 15.20      | 100                       | 0.430     | 2095                      | 900                        | 163.5                       | 3.9        |
|                                                                                   |                             | 15.50      | 100                       | 0.435     | 2055                      | 895                        | 169.0                       | 3.9        |
|                                                                                   |                             | 15.70      | 100                       | 0.435     | 2025                      | 880                        | 170.5                       | 4.0        |
|                                                                                   |                             | 15.80      | 100                       | 0.440     | 2015                      | 885                        | 173.5                       | 3.9        |
|                                                                                   |                             | 16.00      | 100                       | 0.440     | 1990                      | 875                        | 176.0                       | 4.0        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 14.20      | 55                        | 0.315     | 1235                      | 390                        | 62.0                        | 9.1        |
|                                                                                                                        | 14.50      | 55                        | 0.320     | 1205                      | 385                        | 63.5                        | 9.2        |
|                                                                                                                        | 14.80      | 55                        | 0.325     | 1185                      | 385                        | 66.0                        | 9.1        |
|                                                                                                                        | 15.00      | 55                        | 0.330     | 1165                      | 385                        | 68.0                        | 9.1        |
|                                                                                                                        | 15.20      | 55                        | 0.330     | 1150                      | 380                        | 69.0                        | 9.2        |
|                                                                                                                        | 15.50      | 55                        | 0.335     | 1130                      | 380                        | 71.5                        | 9.2        |
|                                                                                                                        | 15.70      | 55                        | 0.335     | 1115                      | 375                        | 72.5                        | 9.3        |
|                                                                                                                        | 15.80      | 55                        | 0.340     | 1110                      | 375                        | 73.5                        | 9.3        |
|                                                                                                                        | 16.00      | 55                        | 0.340     | 1095                      | 370                        | 74.5                        | 9.4        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 14.20      | 70                        | 0.315     | 1570                      | 495                        | 78.5                        | 7.2        |
|                                                                                                                        | 14.50      | 70                        | 0.320     | 1535                      | 490                        | 81.0                        | 7.2        |
|                                                                                                                        | 14.80      | 70                        | 0.325     | 1505                      | 490                        | 84.5                        | 7.2        |
|                                                                                                                        | 15.00      | 70                        | 0.330     | 1485                      | 490                        | 86.5                        | 7.2        |
|                                                                                                                        | 15.20      | 70                        | 0.330     | 1465                      | 485                        | 88.0                        | 7.2        |
|                                                                                                                        | 15.50      | 70                        | 0.335     | 1440                      | 480                        | 90.5                        | 7.3        |
|                                                                                                                        | 15.70      | 70                        | 0.335     | 1420                      | 475                        | 92.0                        | 7.3        |
|                                                                                                                        | 15.80      | 70                        | 0.340     | 1410                      | 480                        | 94.0                        | 7.3        |
|                                                                                                                        | 16.00      | 70                        | 0.340     | 1395                      | 475                        | 95.5                        | 7.3        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Titanes alliés trempés<br>>300 HB<br>[Ti6Al4V]                                                                         | 14.20      | 40                        | 0.315     | 895                       | 280                        | 44.5                        | 12.7       |
|                                                                                                                        | 14.50      | 40                        | 0.320     | 880                       | 280                        | 46.0                        | 12.6       |
|                                                                                                                        | 14.80      | 40                        | 0.325     | 860                       | 280                        | 48.0                        | 12.6       |
|                                                                                                                        | 15.00      | 40                        | 0.330     | 850                       | 280                        | 49.5                        | 12.6       |
|                                                                                                                        | 15.20      | 40                        | 0.330     | 840                       | 275                        | 50.0                        | 12.8       |
|                                                                                                                        | 15.50      | 40                        | 0.335     | 820                       | 275                        | 52.0                        | 12.7       |
|                                                                                                                        | 15.70      | 40                        | 0.335     | 810                       | 270                        | 52.5                        | 12.9       |
|                                                                                                                        | 15.80      | 40                        | 0.340     | 805                       | 275                        | 54.0                        | 12.7       |
|                                                                                                                        | 16.00      | 40                        | 0.340     | 795                       | 270                        | 54.5                        | 12.9       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 14.20      | 240                       | 0.625     | 5380                      | 3365                       | 533.0                       | 1.1        |
|                                                                                                                        | 14.50      | 240                       | 0.630     | 5270                      | 3320                       | 548.0                       | 1.1        |
|                                                                                                                        | 14.80      | 240                       | 0.635     | 5160                      | 3275                       | 563.5                       | 1.1        |
|                                                                                                                        | 15.00      | 240                       | 0.645     | 5095                      | 3285                       | 580.5                       | 1.1        |
|                                                                                                                        | 15.20      | 240                       | 0.655     | 5025                      | 3290                       | 597.0                       | 1.1        |
|                                                                                                                        | 15.50      | 240                       | 0.660     | 4930                      | 3255                       | 614.0                       | 1.1        |
|                                                                                                                        | 15.70      | 240                       | 0.660     | 4865                      | 3210                       | 621.5                       | 1.1        |
|                                                                                                                        | 15.80      | 240                       | 0.665     | 4835                      | 3215                       | 630.5                       | 1.1        |
|                                                                                                                        | 16.00      | 240                       | 0.670     | 4775                      | 3200                       | 643.5                       | 1.1        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

# Forets hélicoïdaux XDrill®

5xd



|             |                |                 |                 |              |  |  |                   |                |       |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|

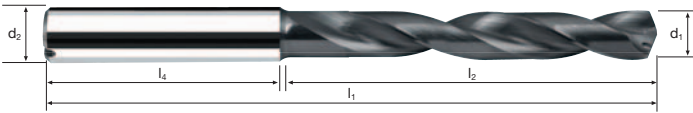
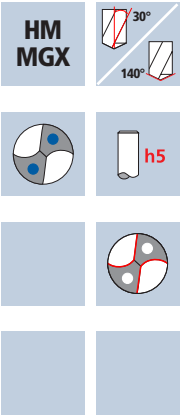
| Exemple:<br>N° cde  |          |          |     |    |    |                  | DURO-X |   |
|---------------------|----------|----------|-----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | B72015 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1  | l2 | l4 | L <sub>max</sub> |        |   |
| .1410               | 14.1     | 16       | 133 | 83 | 48 | 59.2             |        | ● |
| .1420               | 14.2     | 16       | 133 | 83 | 48 | 59.1             |        | ● |
| .1430               | 14.3     | 16       | 133 | 83 | 48 | 59.1             |        | ● |
| .1440               | 14.4     | 16       | 133 | 83 | 48 | 59.0             |        | ● |
| .1450               | 14.5     | 16       | 133 | 83 | 48 | 59.0             |        | ● |
| .1460               | 14.6     | 16       | 133 | 83 | 48 | 58.8             |        | ● |
| .1470               | 14.7     | 16       | 133 | 83 | 48 | 58.8             |        | ● |
| .1480               | 14.8     | 16       | 133 | 83 | 48 | 58.7             |        | ● |
| .1490               | 14.9     | 16       | 133 | 83 | 48 | 58.7             |        | ● |
| .1500               | 15.0     | 16       | 133 | 83 | 48 | 58.6             |        | ● |
| .1510               | 15.1     | 16       | 133 | 83 | 48 | 58.6             |        | ● |
| .1520               | 15.2     | 16       | 133 | 83 | 48 | 58.5             |        | ● |
| .1530               | 15.3     | 16       | 133 | 83 | 48 | 58.5             |        | ● |
| .1540               | 15.4     | 16       | 133 | 83 | 48 | 58.3             |        | ● |
| .1550               | 15.5     | 16       | 133 | 83 | 48 | 58.3             |        | ● |
| .1560               | 15.6     | 16       | 133 | 83 | 48 | 58.2             |        | ● |
| .1570               | 15.7     | 16       | 133 | 83 | 48 | 58.2             |        | ● |
| .1580               | 15.8     | 16       | 133 | 83 | 48 | 58.1             |        | ● |
| .1590               | 15.9     | 16       | 133 | 83 | 48 | 58.1             |        | ● |
| .1600               | 16.0     | 16       | 133 | 83 | 48 | 58.1             |        | ● |
|                     |          |          |     |    |    |                  |        |   |
|                     |          |          |     |    |    |                  |        |   |
|                     |          |          |     |    |    |                  |        |   |

| Application                                                                       | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²       | 16.20      | 180                       | 0.740     | 3535                      | 2615                       | 539.0                       | 1.5        |
|                                                                                   |                             | 16.40      | 180                       | 0.750     | 3495                      | 2620                       | 553.5                       | 1.5        |
|                                                                                   |                             | 16.50      | 180                       | 0.755     | 3470                      | 2620                       | 560.0                       | 1.5        |
|                                                                                   |                             | 16.80      | 180                       | 0.755     | 3410                      | 2575                       | 571.0                       | 1.5        |
|                                                                                   |                             | 17.00      | 180                       | 0.760     | 3370                      | 2560                       | 581.0                       | 1.5        |
|                                                                                   |                             | 17.20      | 180                       | 0.765     | 3330                      | 2545                       | 591.5                       | 1.5        |
|                                                                                   |                             | 17.50      | 180                       | 0.770     | 3275                      | 2520                       | 606.0                       | 1.6        |
|                                                                                   |                             | 17.70      | 180                       | 0.775     | 3235                      | 2505                       | 616.5                       | 1.6        |
|                                                                                   |                             | 18.00      | 180                       | 0.780     | 3185                      | 2485                       | 632.5                       | 1.6        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm²   | 16.20      | 160                       | 0.635     | 3145                      | 1995                       | 411.0                       | 2.0        |
|                                                                                   |                             | 16.40      | 160                       | 0.640     | 3105                      | 1985                       | 419.5                       | 2.0        |
|                                                                                   |                             | 16.50      | 160                       | 0.645     | 3085                      | 1990                       | 425.5                       | 2.0        |
|                                                                                   |                             | 16.80      | 160                       | 0.650     | 3030                      | 1970                       | 436.5                       | 2.0        |
|                                                                                   |                             | 17.00      | 160                       | 0.650     | 2995                      | 1945                       | 441.5                       | 2.0        |
|                                                                                   |                             | 17.20      | 160                       | 0.655     | 2960                      | 1940                       | 451.0                       | 2.0        |
|                                                                                   |                             | 17.50      | 160                       | 0.660     | 2910                      | 1920                       | 462.0                       | 2.0        |
|                                                                                   |                             | 17.70      | 160                       | 0.660     | 2875                      | 1900                       | 467.5                       | 2.1        |
|                                                                                   |                             | 18.00      | 160                       | 0.670     | 2830                      | 1895                       | 482.0                       | 2.1        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | 16.20      | 140                       | 0.585     | 2750                      | 1610                       | 332.0                       | 2.5        |
|                                                                                   |                             | 16.40      | 140                       | 0.590     | 2715                      | 1600                       | 338.0                       | 2.5        |
|                                                                                   |                             | 16.50      | 140                       | 0.595     | 2700                      | 1605                       | 343.0                       | 2.5        |
|                                                                                   |                             | 16.80      | 140                       | 0.595     | 2655                      | 1580                       | 350.0                       | 2.5        |
|                                                                                   |                             | 17.00      | 140                       | 0.600     | 2620                      | 1570                       | 356.5                       | 2.5        |
|                                                                                   |                             | 17.20      | 140                       | 0.600     | 2590                      | 1555                       | 361.5                       | 2.5        |
|                                                                                   |                             | 17.50      | 140                       | 0.610     | 2545                      | 1550                       | 373.0                       | 2.5        |
|                                                                                   |                             | 17.70      | 140                       | 0.610     | 2520                      | 1535                       | 377.5                       | 2.5        |
|                                                                                   |                             | 18.00      | 140                       | 0.615     | 2475                      | 1520                       | 387.0                       | 2.6        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm² | 16.20      | 100                       | 0.445     | 1965                      | 875                        | 180.5                       | 4.5        |
|                                                                                   |                             | 16.40      | 100                       | 0.450     | 1940                      | 875                        | 185.0                       | 4.5        |
|                                                                                   |                             | 16.50      | 100                       | 0.450     | 1930                      | 870                        | 186.0                       | 4.5        |
|                                                                                   |                             | 16.80      | 100                       | 0.455     | 1895                      | 860                        | 190.5                       | 4.6        |
|                                                                                   |                             | 17.00      | 100                       | 0.455     | 1870                      | 850                        | 193.0                       | 4.6        |
|                                                                                   |                             | 17.20      | 100                       | 0.460     | 1850                      | 850                        | 197.5                       | 4.6        |
|                                                                                   |                             | 17.50      | 100                       | 0.460     | 1820                      | 835                        | 201.0                       | 4.7        |
|                                                                                   |                             | 17.70      | 100                       | 0.465     | 1800                      | 835                        | 205.5                       | 4.7        |
|                                                                                   |                             | 18.00      | 100                       | 0.470     | 1770                      | 830                        | 211.0                       | 4.7        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 16.20      | 55                        | 0.340     | 1080                      | 365                        | 75.0                        | 10.9       |
|                                                                                                                        | 16.40      | 55                        | 0.345     | 1070                      | 370                        | 78.0                        | 10.7       |
|                                                                                                                        | 16.50      | 55                        | 0.350     | 1060                      | 370                        | 79.0                        | 10.7       |
|                                                                                                                        | 16.80      | 55                        | 0.350     | 1040                      | 365                        | 81.0                        | 10.8       |
|                                                                                                                        | 17.00      | 55                        | 0.350     | 1030                      | 360                        | 81.5                        | 10.9       |
|                                                                                                                        | 17.20      | 55                        | 0.350     | 1020                      | 355                        | 82.5                        | 11.1       |
|                                                                                                                        | 17.50      | 55                        | 0.355     | 1000                      | 355                        | 85.5                        | 11.0       |
|                                                                                                                        | 17.70      | 55                        | 0.355     | 990                       | 350                        | 86.0                        | 11.2       |
|                                                                                                                        | 18.00      | 55                        | 0.360     | 975                       | 350                        | 89.0                        | 11.1       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 16.20      | 70                        | 0.340     | 1375                      | 470                        | 97.0                        | 8.4        |
|                                                                                                                        | 16.40      | 70                        | 0.345     | 1360                      | 470                        | 99.5                        | 8.4        |
|                                                                                                                        | 16.50      | 70                        | 0.350     | 1350                      | 475                        | 101.5                       | 8.3        |
|                                                                                                                        | 16.80      | 70                        | 0.350     | 1325                      | 465                        | 103.0                       | 8.5        |
|                                                                                                                        | 17.00      | 70                        | 0.350     | 1310                      | 460                        | 104.5                       | 8.6        |
|                                                                                                                        | 17.20      | 70                        | 0.350     | 1295                      | 455                        | 105.5                       | 8.6        |
|                                                                                                                        | 17.50      | 70                        | 0.355     | 1275                      | 455                        | 109.5                       | 8.6        |
|                                                                                                                        | 17.70      | 70                        | 0.355     | 1260                      | 445                        | 109.5                       | 8.8        |
|                                                                                                                        | 18.00      | 70                        | 0.360     | 1240                      | 445                        | 113.0                       | 8.8        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Titanes alliés trempés<br>>300 HB<br>[Ti6Al4V]                                                                         | 16.20      | 40                        | 0.340     | 785                       | 265                        | 54.5                        | 15.0       |
|                                                                                                                        | 16.40      | 40                        | 0.345     | 775                       | 265                        | 56.0                        | 14.9       |
|                                                                                                                        | 16.50      | 40                        | 0.350     | 770                       | 270                        | 57.5                        | 14.6       |
|                                                                                                                        | 16.80      | 40                        | 0.350     | 760                       | 265                        | 58.5                        | 14.9       |
|                                                                                                                        | 17.00      | 40                        | 0.350     | 750                       | 265                        | 60.0                        | 14.9       |
|                                                                                                                        | 17.20      | 40                        | 0.350     | 740                       | 260                        | 60.5                        | 15.1       |
|                                                                                                                        | 17.50      | 40                        | 0.355     | 730                       | 260                        | 62.5                        | 15.1       |
|                                                                                                                        | 17.70      | 40                        | 0.355     | 720                       | 255                        | 62.5                        | 15.3       |
|                                                                                                                        | 18.00      | 40                        | 0.360     | 705                       | 255                        | 65.0                        | 15.3       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 16.20      | 240                       | 0.675     | 4715                      | 3185                       | 656.5                       | 1.2        |
|                                                                                                                        | 16.40      | 240                       | 0.680     | 4660                      | 3170                       | 669.5                       | 1.2        |
|                                                                                                                        | 16.50      | 240                       | 0.685     | 4630                      | 3170                       | 678.0                       | 1.2        |
|                                                                                                                        | 16.80      | 240                       | 0.685     | 4545                      | 3115                       | 690.5                       | 1.3        |
|                                                                                                                        | 17.00      | 240                       | 0.690     | 4495                      | 3100                       | 703.5                       | 1.3        |
|                                                                                                                        | 17.20      | 240                       | 0.695     | 4440                      | 3085                       | 717.0                       | 1.3        |
|                                                                                                                        | 17.50      | 240                       | 0.700     | 4365                      | 3055                       | 735.0                       | 1.3        |
|                                                                                                                        | 17.70      | 240                       | 0.705     | 4315                      | 3040                       | 748.0                       | 1.3        |
|                                                                                                                        | 18.00      | 240                       | 0.710     | 4245                      | 3015                       | 767.0                       | 1.3        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

Forets hélicoïdaux XDrill®

5xd



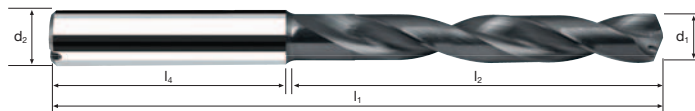
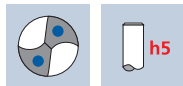
|             |                |                 |                 |              |  |  |                   |                |       |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|

| Exemple: N° cde     |          |          |     |    |    |                  | DURO-X |   |
|---------------------|----------|----------|-----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | B72015 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1  | l2 | l4 | L <sub>max</sub> |        |   |
| .1610               | 16.1     | 18       | 143 | 93 | 48 | 66.2             |        | ● |
| .1620               | 16.2     | 18       | 143 | 93 | 48 | 66.1             |        | ● |
| .1630               | 16.3     | 18       | 143 | 93 | 48 | 66.1             |        | ● |
| .1640               | 16.4     | 18       | 143 | 93 | 48 | 65.9             |        | ● |
| .1650               | 16.5     | 18       | 143 | 93 | 48 | 65.9             |        | ● |
| .1660               | 16.6     | 18       | 143 | 93 | 48 | 65.8             |        | ● |
| .1670               | 16.7     | 18       | 143 | 93 | 48 | 65.8             |        | ● |
| .1680               | 16.8     | 18       | 143 | 93 | 48 | 65.7             |        | ● |
| .1690               | 16.9     | 18       | 143 | 93 | 48 | 65.7             |        | ● |
| .1700               | 17.0     | 18       | 143 | 93 | 48 | 65.6             |        | ● |
| .1710               | 17.1     | 18       | 143 | 93 | 48 | 65.5             |        | ● |
| .1720               | 17.2     | 18       | 143 | 93 | 48 | 65.4             |        | ● |
| .1730               | 17.3     | 18       | 143 | 93 | 48 | 65.4             |        | ● |
| .1740               | 17.4     | 18       | 143 | 93 | 48 | 65.3             |        | ● |
| .1750               | 17.5     | 18       | 143 | 93 | 48 | 65.3             |        | ● |
| .1760               | 17.6     | 18       | 143 | 93 | 48 | 65.2             |        | ● |
| .1770               | 17.7     | 18       | 143 | 93 | 48 | 65.2             |        | ● |
| .1780               | 17.8     | 18       | 143 | 93 | 48 | 65.1             |        | ● |
| .1790               | 17.9     | 18       | 143 | 93 | 48 | 65.1             |        | ● |
| .1800               | 18.0     | 18       | 143 | 93 | 48 | 65.0             |        | ● |
|                     |          |          |     |    |    |                  |        |   |
|                     |          |          |     |    |    |                  |        |   |
|                     |          |          |     |    |    |                  |        |   |

| Application                                                                       | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²       | 18.50      | 180                       | 0.785     | 3095                      | 2430                       | 653.0                       | 1.7        |
|                                                                                   |                             | 18.70      | 180                       | 0.785     | 3065                      | 2405                       | 660.5                       | 1.8        |
|                                                                                   |                             | 19.00      | 180                       | 0.790     | 3015                      | 2380                       | 675.0                       | 1.8        |
|                                                                                   |                             | 19.20      | 180                       | 0.795     | 2985                      | 2375                       | 687.5                       | 1.8        |
|                                                                                   |                             | 19.30      | 180                       | 0.800     | 2970                      | 2375                       | 695.0                       | 1.8        |
|                                                                                   |                             | 19.50      | 180                       | 0.805     | 2940                      | 2365                       | 706.5                       | 1.8        |
|                                                                                   |                             | 19.70      | 180                       | 0.810     | 2910                      | 2355                       | 718.0                       | 1.8        |
|                                                                                   |                             | 19.80      | 180                       | 0.810     | 2895                      | 2345                       | 722.0                       | 1.8        |
|                                                                                   |                             | 20.00      | 180                       | 0.820     | 2865                      | 2350                       | 738.5                       | 1.8        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm²   | 18.50      | 160                       | 0.670     | 2755                      | 1845                       | 496.0                       | 2.3        |
|                                                                                   |                             | 18.70      | 160                       | 0.675     | 2725                      | 1840                       | 505.5                       | 2.3        |
|                                                                                   |                             | 19.00      | 160                       | 0.680     | 2680                      | 1820                       | 516.0                       | 2.3        |
|                                                                                   |                             | 19.20      | 160                       | 0.680     | 2655                      | 1805                       | 522.5                       | 2.3        |
|                                                                                   |                             | 19.30      | 160                       | 0.685     | 2640                      | 1810                       | 529.5                       | 2.3        |
|                                                                                   |                             | 19.50      | 160                       | 0.690     | 2610                      | 1800                       | 537.5                       | 2.3        |
|                                                                                   |                             | 19.70      | 160                       | 0.690     | 2585                      | 1785                       | 544.0                       | 2.4        |
|                                                                                   |                             | 19.80      | 160                       | 0.695     | 2570                      | 1785                       | 549.5                       | 2.4        |
|                                                                                   |                             | 20.00      | 160                       | 0.705     | 2545                      | 1795                       | 564.0                       | 2.3        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | 18.50      | 140                       | 0.620     | 2410                      | 1495                       | 402.0                       | 2.8        |
|                                                                                   |                             | 18.70      | 140                       | 0.620     | 2385                      | 1480                       | 406.5                       | 2.9        |
|                                                                                   |                             | 19.00      | 140                       | 0.625     | 2345                      | 1465                       | 415.5                       | 2.9        |
|                                                                                   |                             | 19.20      | 140                       | 0.625     | 2320                      | 1450                       | 420.0                       | 2.9        |
|                                                                                   |                             | 19.30      | 140                       | 0.630     | 2310                      | 1455                       | 425.5                       | 2.9        |
|                                                                                   |                             | 19.50      | 140                       | 0.635     | 2285                      | 1450                       | 433.0                       | 2.9        |
|                                                                                   |                             | 19.70      | 140                       | 0.640     | 2260                      | 1445                       | 440.5                       | 2.9        |
|                                                                                   |                             | 19.80      | 140                       | 0.640     | 2250                      | 1440                       | 443.5                       | 2.9        |
|                                                                                   |                             | 20.00      | 140                       | 0.645     | 2230                      | 1440                       | 452.5                       | 2.9        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm² | 18.50      | 100                       | 0.470     | 1720                      | 810                        | 217.5                       | 5.2        |
|                                                                                   |                             | 18.70      | 100                       | 0.470     | 1700                      | 800                        | 219.5                       | 5.3        |
|                                                                                   |                             | 19.00      | 100                       | 0.475     | 1675                      | 795                        | 225.5                       | 5.3        |
|                                                                                   |                             | 19.20      | 100                       | 0.475     | 1660                      | 790                        | 228.5                       | 5.3        |
|                                                                                   |                             | 19.30      | 100                       | 0.480     | 1650                      | 790                        | 231.0                       | 5.3        |
|                                                                                   |                             | 19.50      | 100                       | 0.485     | 1630                      | 790                        | 236.0                       | 5.3        |
|                                                                                   |                             | 19.70      | 100                       | 0.485     | 1615                      | 785                        | 239.5                       | 5.4        |
|                                                                                   |                             | 19.80      | 100                       | 0.485     | 1610                      | 780                        | 240.0                       | 5.4        |
|                                                                                   |                             | 20.00      | 100                       | 0.490     | 1590                      | 780                        | 245.0                       | 5.4        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 18.50      | 55                        | 0.360     | 945                       | 340                        | 91.5                        | 12.5       |
|                                                                                                                        | 18.70      | 55                        | 0.360     | 935                       | 335                        | 92.0                        | 12.7       |
|                                                                                                                        | 19.00      | 55                        | 0.365     | 920                       | 335                        | 95.0                        | 12.6       |
|                                                                                                                        | 19.20      | 55                        | 0.365     | 910                       | 330                        | 95.5                        | 12.8       |
|                                                                                                                        | 19.30      | 55                        | 0.370     | 905                       | 335                        | 98.0                        | 12.6       |
|                                                                                                                        | 19.50      | 55                        | 0.370     | 900                       | 335                        | 100.0                       | 12.6       |
|                                                                                                                        | 19.70      | 55                        | 0.375     | 890                       | 335                        | 102.0                       | 12.6       |
|                                                                                                                        | 19.80      | 55                        | 0.375     | 885                       | 330                        | 101.5                       | 12.7       |
|                                                                                                                        | 20.00      | 55                        | 0.380     | 875                       | 335                        | 105.0                       | 12.5       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 18.50      | 70                        | 0.360     | 1205                      | 435                        | 117.0                       | 9.8        |
|                                                                                                                        | 18.70      | 70                        | 0.360     | 1190                      | 430                        | 118.0                       | 9.9        |
|                                                                                                                        | 19.00      | 70                        | 0.365     | 1175                      | 430                        | 122.0                       | 9.8        |
|                                                                                                                        | 19.20      | 70                        | 0.365     | 1160                      | 425                        | 123.0                       | 9.9        |
|                                                                                                                        | 19.30      | 70                        | 0.370     | 1155                      | 425                        | 124.5                       | 9.9        |
|                                                                                                                        | 19.50      | 70                        | 0.370     | 1145                      | 425                        | 127.0                       | 9.9        |
|                                                                                                                        | 19.70      | 70                        | 0.375     | 1130                      | 425                        | 129.5                       | 9.9        |
|                                                                                                                        | 19.80      | 70                        | 0.375     | 1125                      | 420                        | 129.5                       | 10.0       |
|                                                                                                                        | 20.00      | 70                        | 0.380     | 1115                      | 425                        | 133.5                       | 9.9        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Titanes alliés trempés<br>>300 HB<br>[Ti6Al4V]                                                                         | 18.50      | 40                        | 0.360     | 690                       | 250                        | 67.0                        | 17.0       |
|                                                                                                                        | 18.70      | 40                        | 0.360     | 680                       | 245                        | 67.5                        | 17.3       |
|                                                                                                                        | 19.00      | 40                        | 0.365     | 670                       | 245                        | 69.5                        | 17.3       |
|                                                                                                                        | 19.20      | 40                        | 0.365     | 665                       | 245                        | 71.0                        | 17.2       |
|                                                                                                                        | 19.30      | 40                        | 0.370     | 660                       | 245                        | 71.5                        | 17.2       |
|                                                                                                                        | 19.50      | 40                        | 0.370     | 655                       | 240                        | 71.5                        | 17.6       |
|                                                                                                                        | 19.70      | 40                        | 0.375     | 645                       | 240                        | 73.0                        | 17.5       |
|                                                                                                                        | 19.80      | 40                        | 0.375     | 645                       | 240                        | 74.0                        | 17.5       |
|                                                                                                                        | 20.00      | 40                        | 0.380     | 635                       | 240                        | 75.5                        | 17.5       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 18.50      | 240                       | 0.710     | 4130                      | 2930                       | 787.5                       | 1.5        |
|                                                                                                                        | 18.70      | 240                       | 0.715     | 4085                      | 2920                       | 802.0                       | 1.5        |
|                                                                                                                        | 19.00      | 240                       | 0.720     | 4020                      | 2895                       | 821.0                       | 1.5        |
|                                                                                                                        | 19.20      | 240                       | 0.720     | 3980                      | 2865                       | 829.5                       | 1.5        |
|                                                                                                                        | 19.30      | 240                       | 0.725     | 3960                      | 2870                       | 839.5                       | 1.5        |
|                                                                                                                        | 19.50      | 240                       | 0.735     | 3920                      | 2880                       | 860.0                       | 1.5        |
|                                                                                                                        | 19.70      | 240                       | 0.735     | 3880                      | 2850                       | 868.5                       | 1.5        |
|                                                                                                                        | 19.80      | 240                       | 0.740     | 3860                      | 2855                       | 879.0                       | 1.5        |
|                                                                                                                        | 20.00      | 240                       | 0.745     | 3820                      | 2845                       | 894.0                       | 1.5        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

5xd



|                    |                       |                        |                        |                     |  |  |                          |                       |              |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|--------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>GG(G)</b> |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|--------------|

[illegible]

## Application



## Matières

Aciers  
< 500 N/mm<sup>2</sup>

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 2.50       | 140                       | 0.060     | 17825                     | 1070                       | 5.5                         | 1.2        |
| 2.60       | 140                       | 0.060     | 17140                     | 1030                       | 5.5                         | 1.2        |
| 2.80       | 140                       | 0.065     | 15915                     | 1035                       | 6.5                         | 1.2        |
| 2.90       | 140                       | 0.070     | 15365                     | 1075                       | 7.0                         | 1.1        |
| 3.00       | 170                       | 0.080     | 18040                     | 1445                       | 10.0                        | 0.8        |
| 3.30       | 170                       | 0.085     | 16400                     | 1395                       | 12.0                        | 0.9        |
| 3.50       | 170                       | 0.090     | 15460                     | 1390                       | 13.5                        | 0.9        |
| 3.70       | 170                       | 0.095     | 14625                     | 1390                       | 15.0                        | 0.8        |
| 3.80       | 170                       | 0.100     | 14240                     | 1425                       | 16.0                        | 1.2        |

Aciers  
500 - 850 N/mm<sup>2</sup>

|      |     |       |       |      |      |     |
|------|-----|-------|-------|------|------|-----|
| 2.50 | 110 | 0.060 | 14005 | 840  | 4.0  | 1.5 |
| 2.60 | 110 | 0.060 | 13465 | 810  | 4.5  | 1.5 |
| 2.80 | 110 | 0.065 | 12505 | 815  | 5.0  | 1.5 |
| 2.90 | 110 | 0.070 | 12075 | 845  | 5.5  | 1.4 |
| 3.00 | 130 | 0.080 | 13795 | 1105 | 8.0  | 1.1 |
| 3.30 | 130 | 0.085 | 12540 | 1065 | 9.0  | 1.1 |
| 3.50 | 130 | 0.090 | 11825 | 1065 | 10.0 | 1.1 |
| 3.70 | 130 | 0.095 | 11185 | 1065 | 11.5 | 1.1 |
| 3.80 | 130 | 0.100 | 10890 | 1090 | 12.5 | 1.5 |

Aciers  
850 - 1100 N/mm<sup>2</sup>

|      |     |       |       |     |     |     |
|------|-----|-------|-------|-----|-----|-----|
| 2.50 | 80  | 0.045 | 10185 | 460 | 2.5 | 2.7 |
| 2.60 | 80  | 0.045 | 9795  | 440 | 2.5 | 2.8 |
| 2.80 | 80  | 0.050 | 9095  | 455 | 3.0 | 2.7 |
| 2.90 | 80  | 0.050 | 8780  | 440 | 3.0 | 2.8 |
| 3.00 | 110 | 0.060 | 11670 | 700 | 5.0 | 1.7 |
| 3.30 | 110 | 0.065 | 10610 | 690 | 6.0 | 1.7 |
| 3.50 | 110 | 0.070 | 10005 | 700 | 6.5 | 1.7 |
| 3.70 | 110 | 0.075 | 9465  | 710 | 7.5 | 1.7 |
| 3.80 | 110 | 0.075 | 9215  | 690 | 8.0 | 2.4 |

Aciers  
1100 - 1300 N/mm<sup>2</sup>

|      |    |       |      |     |     |     |
|------|----|-------|------|-----|-----|-----|
| 2.50 | 55 | 0.040 | 7005 | 280 | 1.5 | 4.4 |
| 2.60 | 55 | 0.040 | 6735 | 270 | 1.5 | 4.6 |
| 2.80 | 55 | 0.040 | 6255 | 250 | 1.5 | 4.9 |
| 2.90 | 55 | 0.045 | 6035 | 270 | 2.0 | 4.5 |
| 3.00 | 70 | 0.050 | 7425 | 370 | 2.5 | 3.3 |
| 3.30 | 70 | 0.055 | 6750 | 370 | 3.0 | 3.2 |
| 3.50 | 70 | 0.060 | 6365 | 380 | 3.5 | 3.1 |
| 3.70 | 70 | 0.060 | 6020 | 360 | 4.0 | 3.3 |
| 3.80 | 70 | 0.065 | 5865 | 380 | 4.5 | 4.3 |

## Matières

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|      |    |       |      |     |     |      |
|------|----|-------|------|-----|-----|------|
| 2.50 | 25 | 0.025 | 3185 | 80  | 0.5 | 15.6 |
| 2.60 | 25 | 0.025 | 3060 | 75  | 0.5 | 16.5 |
| 2.80 | 25 | 0.030 | 2840 | 85  | 0.5 | 14.4 |
| 2.90 | 25 | 0.030 | 2745 | 80  | 0.5 | 15.3 |
| 3.00 | 40 | 0.040 | 4245 | 170 | 1.0 | 7.1  |
| 3.30 | 40 | 0.045 | 3860 | 175 | 1.5 | 6.8  |
| 3.50 | 40 | 0.045 | 3640 | 165 | 1.5 | 7.2  |
| 3.70 | 40 | 0.050 | 3440 | 170 | 2.0 | 6.9  |
| 3.80 | 40 | 0.050 | 3350 | 170 | 2.0 | 9.7  |

Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]  
Aciers inoxydables  
[Cr-Ni/1.4301]

|      |    |       |      |     |     |     |
|------|----|-------|------|-----|-----|-----|
| 2.50 | 50 | 0.030 | 6365 | 190 | 1.0 | 6.6 |
| 2.60 | 50 | 0.035 | 6120 | 215 | 1.0 | 5.7 |
| 2.80 | 50 | 0.035 | 5685 | 200 | 1.0 | 6.1 |
| 2.90 | 50 | 0.035 | 5490 | 190 | 1.5 | 6.4 |
| 3.00 | 60 | 0.045 | 6365 | 285 | 2.0 | 4.3 |
| 3.30 | 60 | 0.050 | 5785 | 290 | 2.5 | 4.1 |
| 3.50 | 60 | 0.055 | 5455 | 300 | 3.0 | 3.9 |
| 3.70 | 60 | 0.055 | 5160 | 285 | 3.0 | 4.1 |
| 3.80 | 60 | 0.060 | 5025 | 300 | 3.5 | 5.5 |

Fonte  
grise / sphéroïdale

|      |     |       |       |      |      |     |
|------|-----|-------|-------|------|------|-----|
| 2.50 | 160 | 0.065 | 20370 | 1325 | 6.5  | 0.9 |
| 2.60 | 160 | 0.065 | 19590 | 1275 | 7.0  | 1.0 |
| 2.80 | 160 | 0.070 | 18190 | 1275 | 8.0  | 1.0 |
| 2.90 | 160 | 0.075 | 17560 | 1315 | 8.5  | 0.9 |
| 3.00 | 220 | 0.085 | 23345 | 1985 | 14.0 | 0.6 |
| 3.30 | 220 | 0.095 | 21220 | 2015 | 17.0 | 0.6 |
| 3.50 | 220 | 0.100 | 20010 | 2000 | 19.0 | 0.6 |
| 3.70 | 220 | 0.105 | 18925 | 1985 | 21.5 | 0.6 |
| 3.80 | 220 | 0.110 | 18430 | 2025 | 23.0 | 0.8 |

Aluminium corroyé  
Si < 6%

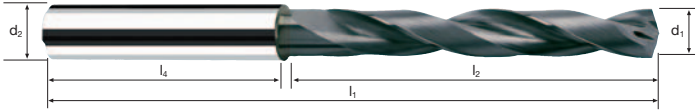
|      |     |       |       |      |      |     |
|------|-----|-------|-------|------|------|-----|
| 2.50 | 220 | 0.050 | 28010 | 1400 | 7.0  | 0.9 |
| 2.60 | 220 | 0.050 | 26935 | 1345 | 7.0  | 0.9 |
| 2.80 | 220 | 0.055 | 25010 | 1375 | 8.5  | 0.9 |
| 2.90 | 220 | 0.060 | 24150 | 1450 | 9.5  | 0.8 |
| 3.00 | 250 | 0.065 | 26525 | 1725 | 12.0 | 0.7 |
| 3.30 | 250 | 0.075 | 24115 | 1810 | 15.5 | 0.7 |
| 3.50 | 250 | 0.080 | 22735 | 1820 | 17.5 | 0.7 |
| 3.70 | 250 | 0.080 | 21505 | 1720 | 18.5 | 0.7 |
| 3.80 | 250 | 0.085 | 20940 | 1780 | 20.0 | 0.9 |



# Forets hélicoïdaux Supradrill® U

5xd

HM  
MG10



|             |                |                 |                 |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|

| Exemple:<br>N° cde         |          |          |    |    |    |                  | NANO-U <sup>2</sup> |   |
|----------------------------|----------|----------|----|----|----|------------------|---------------------|---|
| N° d'article<br>Code-ø     |          |          |    |    |    |                  | B62015              |   |
| B62015 .0250               |          |          |    |    |    |                  | B63015              |   |
| ø<br>Code                  | d1<br>m7 | d2<br>h6 | l1 | l2 | l4 | L <sub>max</sub> |                     |   |
| .0250*                     | 2.50     | 6        | 66 | 28 | 36 | 20.8             |                     | ● |
| .0255*                     | 2.55     | 6        | 66 | 28 | 36 | 20.7             |                     | ● |
| .0260*                     | 2.60     | 6        | 66 | 28 | 36 | 20.6             |                     | ● |
| .0265*                     | 2.65     | 6        | 66 | 28 | 36 | 20.6             |                     | ● |
| .0270*                     | 2.70     | 6        | 66 | 28 | 36 | 20.6             |                     | ● |
| .0280*                     | 2.80     | 6        | 66 | 28 | 36 | 20.4             |                     | ● |
| .0285*                     | 2.85     | 6        | 66 | 28 | 36 | 20.4             |                     | ● |
| .0290*                     | 2.90     | 6        | 66 | 28 | 36 | 20.4             |                     | ● |
| .0295*                     | 2.95     | 6        | 66 | 28 | 36 | 20.3             |                     | ● |
| .0300                      | 3.00     | 6        | 66 | 28 | 36 | 20.2             |                     | ● |
| .0305                      | 3.05     | 6        | 66 | 28 | 36 | 20.2             |                     | ● |
| .0310                      | 3.10     | 6        | 66 | 28 | 36 | 20.2             |                     | ● |
| .0315                      | 3.15     | 6        | 66 | 28 | 36 | 20.1             |                     | ● |
| .0320                      | 3.20     | 6        | 66 | 28 | 36 | 20.0             |                     | ● |
| .0330                      | 3.30     | 6        | 66 | 28 | 36 | 20.0             |                     | ● |
| .0340                      | 3.40     | 6        | 66 | 28 | 36 | 19.8             |                     | ● |
| .0350                      | 3.50     | 6        | 66 | 28 | 36 | 19.8             |                     | ● |
| .0360                      | 3.60     | 6        | 66 | 28 | 36 | 19.6             |                     | ● |
| .0370                      | 3.70     | 6        | 66 | 28 | 36 | 19.6             |                     | ● |
| .0375                      | 3.75     | 6        | 66 | 28 | 36 | 19.5             |                     | ● |
| .0380                      | 3.80     | 6        | 74 | 36 | 36 | 27.4             |                     | ● |
| .0385                      | 3.85     | 6        | 74 | 36 | 36 | 27.3             |                     | ● |
| * sans réfrigérant intégré |          |          |    |    |    |                  |                     |   |

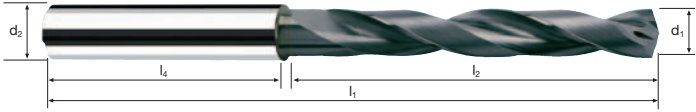
| Application                                                                       | Matières                                | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>       | 4.00       | 170                       | 0.105     | 13530                     | 1420                       | 18.0                        | 1.1        |
|                                                                                   |                                         | 4.20       | 170                       | 0.110     | 12885                     | 1415                       | 19.5                        | 1.1        |
|                                                                                   |                                         | 4.40       | 170                       | 0.115     | 12300                     | 1415                       | 21.5                        | 1.1        |
|                                                                                   |                                         | 4.50       | 170                       | 0.120     | 12025                     | 1445                       | 23.0                        | 1.1        |
|                                                                                   |                                         | 4.80       | 170                       | 0.125     | 11275                     | 1410                       | 25.5                        | 1.5        |
|                                                                                   |                                         | 5.00       | 170                       | 0.130     | 10825                     | 1405                       | 27.5                        | 1.5        |
|                                                                                   |                                         | 5.20       | 170                       | 0.135     | 10405                     | 1405                       | 30.0                        | 1.5        |
|                                                                                   |                                         | 5.30       | 170                       | 0.140     | 10210                     | 1430                       | 31.5                        | 1.4        |
|                                                                                   |                                         | 5.50       | 170                       | 0.145     | 9840                      | 1425                       | 34.0                        | 1.5        |
|                                                                                   |                                         | 4.00       | 130                       | 0.105     | 10345                     | 1085                       | 13.5                        | 1.5        |
|                                                                                   | Aciers<br>500 - 850 N/mm <sup>2</sup>   | 4.20       | 130                       | 0.110     | 9850                      | 1085                       | 15.0                        | 1.5        |
|                                                                                   |                                         | 4.40       | 130                       | 0.115     | 9405                      | 1080                       | 16.5                        | 1.5        |
|                                                                                   |                                         | 4.50       | 130                       | 0.120     | 9195                      | 1105                       | 17.5                        | 1.4        |
|                                                                                   |                                         | 4.80       | 130                       | 0.125     | 8620                      | 1080                       | 19.5                        | 1.9        |
|                                                                                   |                                         | 5.00       | 130                       | 0.130     | 8275                      | 1075                       | 21.0                        | 1.9        |
|                                                                                   |                                         | 5.20       | 130                       | 0.135     | 7960                      | 1075                       | 23.0                        | 1.9        |
|                                                                                   |                                         | 5.30       | 130                       | 0.140     | 7810                      | 1095                       | 24.0                        | 1.9        |
|                                                                                   |                                         | 5.50       | 130                       | 0.145     | 7525                      | 1090                       | 26.0                        | 1.9        |
|                                                                                   |                                         | 4.00       | 110                       | 0.080     | 8755                      | 700                        | 9.0                         | 2.3        |
|                                                                                   |                                         | 4.20       | 110                       | 0.085     | 8335                      | 710                        | 10.0                        | 2.3        |
|                                                                                   | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | 4.40       | 110                       | 0.090     | 7960                      | 715                        | 11.0                        | 2.2        |
|                                                                                   |                                         | 4.50       | 110                       | 0.090     | 7780                      | 700                        | 11.0                        | 2.3        |
|                                                                                   |                                         | 4.80       | 110                       | 0.095     | 7295                      | 695                        | 12.5                        | 3.0        |
|                                                                                   |                                         | 5.00       | 110                       | 0.100     | 7005                      | 700                        | 13.5                        | 3.0        |
|                                                                                   |                                         | 5.20       | 110                       | 0.105     | 6735                      | 705                        | 15.0                        | 2.9        |
|                                                                                   |                                         | 5.30       | 110                       | 0.105     | 6605                      | 695                        | 15.5                        | 3.0        |
|                                                                                   |                                         | 5.50       | 110                       | 0.110     | 6365                      | 700                        | 16.5                        | 3.0        |
|                                                                                   |                                         | 4.00       | 70                        | 0.065     | 5570                      | 360                        | 4.5                         | 4.5        |
|                                                                                   |                                         | 4.20       | 70                        | 0.070     | 5305                      | 370                        | 5.0                         | 4.3        |
|                                                                                   |                                         | 4.40       | 70                        | 0.075     | 5065                      | 380                        | 6.0                         | 4.2        |
|                                                                                   | Aciers<br>1100 - 1300 N/mm <sup>2</sup> | 4.50       | 70                        | 0.075     | 4950                      | 370                        | 6.0                         | 4.3        |
|                                                                                   |                                         | 4.80       | 70                        | 0.080     | 4640                      | 370                        | 6.5                         | 5.6        |
|                                                                                   |                                         | 5.00       | 70                        | 0.085     | 4455                      | 380                        | 7.5                         | 5.5        |
|                                                                                   |                                         | 5.20       | 70                        | 0.085     | 4285                      | 365                        | 8.0                         | 5.7        |
|                                                                                   |                                         | 5.30       | 70                        | 0.090     | 4205                      | 380                        | 8.5                         | 5.5        |
|                                                                                   |                                         | 5.50       | 70                        | 0.090     | 4050                      | 365                        | 8.5                         | 5.7        |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm <sup>2</sup>                                                                                | 4.00       | 40                        | 0.055     | 3185                      | 175                        | 2.0                         | 9.2        |
|                                                                                                                        | 4.20       | 40                        | 0.055     | 3030                      | 165                        | 2.5                         | 9.7        |
|                                                                                                                        | 4.40       | 40                        | 0.060     | 2895                      | 175                        | 2.5                         | 9.1        |
|                                                                                                                        | 4.50       | 40                        | 0.060     | 2830                      | 170                        | 2.5                         | 9.4        |
|                                                                                                                        | 4.80       | 40                        | 0.065     | 2655                      | 175                        | 3.0                         | 11.8       |
|                                                                                                                        | 5.00       | 40                        | 0.065     | 2545                      | 165                        | 3.0                         | 12.7       |
|                                                                                                                        | 5.20       | 40                        | 0.070     | 2450                      | 170                        | 3.5                         | 12.2       |
|                                                                                                                        | 5.30       | 40                        | 0.070     | 2400                      | 170                        | 4.0                         | 12.2       |
|                                                                                                                        | 5.50       | 40                        | 0.075     | 2315                      | 175                        | 4.0                         | 11.8       |
|                                                                                                                        | 4.00       | 60                        | 0.060     | 4775                      | 285                        | 3.5                         | 5.7        |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 4.20       | 60                        | 0.065     | 4545                      | 295                        | 4.0                         | 5.5        |
|                                                                                                                        | 4.40       | 60                        | 0.070     | 4340                      | 305                        | 4.5                         | 5.2        |
|                                                                                                                        | 4.50       | 60                        | 0.070     | 4245                      | 295                        | 4.5                         | 5.4        |
|                                                                                                                        | 4.80       | 60                        | 0.075     | 3980                      | 300                        | 5.5                         | 6.9        |
|                                                                                                                        | 5.00       | 60                        | 0.075     | 3820                      | 285                        | 5.5                         | 7.3        |
|                                                                                                                        | 5.20       | 60                        | 0.080     | 3675                      | 295                        | 6.5                         | 7.0        |
|                                                                                                                        | 5.30       | 60                        | 0.080     | 3605                      | 290                        | 6.5                         | 7.1        |
|                                                                                                                        | 5.50       | 60                        | 0.085     | 3470                      | 295                        | 7.0                         | 7.0        |
|                                                                                                                        | 4.00       | 220                       | 0.115     | 17505                     | 2015                       | 25.5                        | 0.8        |
|                                                                                                                        | 4.20       | 220                       | 0.120     | 16675                     | 2000                       | 27.5                        | 0.8        |
| Fonte<br>grise / sphéroïdale                                                                                           | 4.40       | 220                       | 0.125     | 15915                     | 1990                       | 30.5                        | 0.8        |
|                                                                                                                        | 4.50       | 220                       | 0.130     | 15560                     | 2025                       | 32.0                        | 0.8        |
|                                                                                                                        | 4.80       | 220                       | 0.135     | 14590                     | 1970                       | 35.5                        | 1.0        |
|                                                                                                                        | 5.00       | 220                       | 0.145     | 14005                     | 2030                       | 40.0                        | 1.0        |
|                                                                                                                        | 5.20       | 220                       | 0.150     | 13465                     | 2020                       | 43.0                        | 1.0        |
|                                                                                                                        | 5.30       | 220                       | 0.150     | 13215                     | 1980                       | 43.5                        | 1.0        |
|                                                                                                                        | 5.50       | 220                       | 0.155     | 12730                     | 1975                       | 47.0                        | 1.0        |
|                                                                                                                        | 4.00       | 250                       | 0.090     | 19895                     | 1790                       | 22.5                        | 0.9        |
|                                                                                                                        | 4.20       | 250                       | 0.095     | 18945                     | 1800                       | 25.0                        | 0.9        |
|                                                                                                                        | 4.40       | 250                       | 0.100     | 18085                     | 1810                       | 27.5                        | 0.9        |
| Aluminium corroyé<br>Si < 6%                                                                                           | 4.50       | 250                       | 0.100     | 17685                     | 1770                       | 28.0                        | 0.9        |
|                                                                                                                        | 4.80       | 250                       | 0.105     | 16580                     | 1740                       | 31.5                        | 1.2        |
|                                                                                                                        | 5.00       | 250                       | 0.110     | 15915                     | 1750                       | 34.5                        | 1.2        |
|                                                                                                                        | 5.20       | 250                       | 0.115     | 15305                     | 1760                       | 37.5                        | 1.2        |
|                                                                                                                        | 5.30       | 250                       | 0.120     | 15015                     | 1800                       | 39.5                        | 1.2        |
|                                                                                                                        | 5.50       | 250                       | 0.120     | 14470                     | 1735                       | 41.0                        | 1.2        |

# Forets hélicoïdaux Supradrill® U

5xd

HM  
MG10



|             |                |                 |                 |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|

| Exemple:<br>N° cde     |          |          |    |    |    |                  | NANO-U <sup>2</sup> |   |
|------------------------|----------|----------|----|----|----|------------------|---------------------|---|
| N° d'article<br>Code-ø |          |          |    |    |    |                  | B62015              |   |
| B62015 .0390           |          |          |    |    |    |                  | B63015              |   |
| ø<br>Code              | d1<br>m7 | d2<br>h6 | l1 | l2 | l4 | L <sub>max</sub> |                     |   |
| .0390                  | 3.90     | 6        | 74 | 36 | 36 | 27.4             |                     | ● |
| .0400                  | 4.00     | 6        | 74 | 36 | 36 | 26.9             |                     | ● |
| .0410                  | 4.10     | 6        | 74 | 36 | 36 | 26.9             |                     | ● |
| .0420                  | 4.20     | 6        | 74 | 36 | 36 | 26.8             |                     | ● |
| .0430                  | 4.30     | 6        | 74 | 36 | 36 | 26.8             |                     | ● |
| .0440                  | 4.40     | 6        | 74 | 36 | 36 | 26.6             |                     | ● |
| .0445                  | 4.45     | 6        | 74 | 36 | 36 | 26.6             |                     | ● |
| .0450                  | 4.50     | 6        | 74 | 36 | 36 | 26.6             |                     | ● |
| .0460                  | 4.60     | 6        | 74 | 36 | 36 | 26.5             |                     | ● |
| .0470                  | 4.70     | 6        | 74 | 36 | 36 | 26.5             |                     | ● |
| .0480                  | 4.80     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |
| .0490                  | 4.90     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |
| .0495                  | 4.95     | 6        | 82 | 44 | 36 | 34.3             |                     | ● |
| .0500                  | 5.00     | 6        | 82 | 44 | 36 | 34.8             |                     | ● |
| .0505                  | 5.05     | 6        | 82 | 44 | 36 | 34.7             |                     | ● |
| .0510                  | 5.10     | 6        | 82 | 44 | 36 | 34.7             |                     | ● |
| .0520                  | 5.20     | 6        | 82 | 44 | 36 | 34.6             |                     | ● |
| .0525                  | 5.25     | 6        | 82 | 44 | 36 | 34.6             |                     | ● |
| .0530                  | 5.30     | 6        | 82 | 44 | 36 | 34.6             |                     | ● |
| .0540                  | 5.40     | 6        | 82 | 44 | 36 | 34.5             |                     | ● |
| .0550                  | 5.50     | 6        | 82 | 44 | 36 | 34.5             |                     | ● |
| .0560                  | 5.60     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |
| .0565                  | 5.65     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |

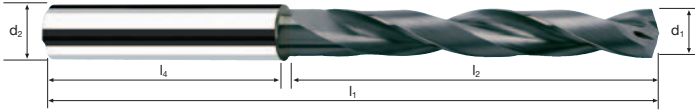
| Application                                                                       | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²       | 5.80       | 170                       | 0.155     | 9330                      | 1445                       | 38.0                        | 1.4        |
|                                                                                   |                             | 6.00       | 170                       | 0.160     | 9020                      | 1445                       | 41.0                        | 1.4        |
|                                                                                   |                             | 6.20       | 170                       | 0.165     | 8730                      | 1440                       | 43.5                        | 1.7        |
|                                                                                   |                             | 6.50       | 170                       | 0.170     | 8325                      | 1415                       | 47.0                        | 1.7        |
|                                                                                   |                             | 6.80       | 170                       | 0.180     | 7960                      | 1435                       | 52.0                        | 1.7        |
|                                                                                   |                             | 7.00       | 170                       | 0.185     | 7730                      | 1430                       | 55.0                        | 1.7        |
|                                                                                   |                             | 7.20       | 170                       | 0.190     | 7515                      | 1430                       | 58.0                        | 1.7        |
|                                                                                   |                             | 7.40       | 170                       | 0.195     | 7315                      | 1425                       | 61.5                        | 1.7        |
|                                                                                   |                             | 7.50       | 170                       | 0.195     | 7215                      | 1405                       | 62.0                        | 1.7        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm²   | 5.80       | 130                       | 0.155     | 7135                      | 1105                       | 29.0                        | 1.9        |
|                                                                                   |                             | 6.00       | 130                       | 0.160     | 6895                      | 1105                       | 31.0                        | 1.9        |
|                                                                                   |                             | 6.20       | 130                       | 0.165     | 6675                      | 1100                       | 33.0                        | 2.2        |
|                                                                                   |                             | 6.50       | 130                       | 0.170     | 6365                      | 1080                       | 36.0                        | 2.3        |
|                                                                                   |                             | 6.80       | 130                       | 0.180     | 6085                      | 1095                       | 40.0                        | 2.2        |
|                                                                                   |                             | 7.00       | 130                       | 0.185     | 5910                      | 1095                       | 42.0                        | 2.2        |
|                                                                                   |                             | 7.20       | 130                       | 0.190     | 5745                      | 1090                       | 44.5                        | 2.2        |
|                                                                                   |                             | 7.40       | 130                       | 0.195     | 5590                      | 1090                       | 47.0                        | 2.2        |
|                                                                                   |                             | 7.50       | 130                       | 0.195     | 5515                      | 1075                       | 47.5                        | 2.3        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | 5.80       | 110                       | 0.115     | 6035                      | 695                        | 18.5                        | 3.0        |
|                                                                                   |                             | 6.00       | 110                       | 0.120     | 5835                      | 700                        | 20.0                        | 3.0        |
|                                                                                   |                             | 6.20       | 110                       | 0.125     | 5645                      | 705                        | 21.5                        | 3.5        |
|                                                                                   |                             | 6.50       | 110                       | 0.130     | 5385                      | 700                        | 23.0                        | 3.5        |
|                                                                                   |                             | 6.80       | 110                       | 0.135     | 5150                      | 695                        | 25.0                        | 3.5        |
|                                                                                   |                             | 7.00       | 110                       | 0.140     | 5000                      | 700                        | 27.0                        | 3.5        |
|                                                                                   |                             | 7.20       | 110                       | 0.145     | 4865                      | 705                        | 28.5                        | 3.5        |
|                                                                                   |                             | 7.40       | 110                       | 0.150     | 4730                      | 710                        | 30.5                        | 3.4        |
|                                                                                   |                             | 7.50       | 110                       | 0.150     | 4670                      | 700                        | 31.0                        | 3.5        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm² | 5.80       | 70                        | 0.095     | 3840                      | 365                        | 9.5                         | 5.7        |
|                                                                                   |                             | 6.00       | 70                        | 0.100     | 3715                      | 370                        | 10.5                        | 5.6        |
|                                                                                   |                             | 6.20       | 70                        | 0.105     | 3595                      | 375                        | 11.5                        | 6.6        |
|                                                                                   |                             | 6.50       | 70                        | 0.110     | 3430                      | 375                        | 12.5                        | 6.6        |
|                                                                                   |                             | 6.80       | 70                        | 0.115     | 3275                      | 375                        | 13.5                        | 6.5        |
|                                                                                   |                             | 7.00       | 70                        | 0.115     | 3185                      | 365                        | 14.0                        | 6.7        |
|                                                                                   |                             | 7.20       | 70                        | 0.120     | 3095                      | 370                        | 15.0                        | 6.6        |
|                                                                                   |                             | 7.40       | 70                        | 0.125     | 3010                      | 375                        | 16.0                        | 6.5        |
|                                                                                   |                             | 7.50       | 70                        | 0.125     | 2970                      | 370                        | 16.5                        | 6.6        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 5.80       | 40                        | 0.075     | 2195                      | 165                        | 4.5                         | 12.5       |
|                                                                                                                        | 6.00       | 40                        | 0.080     | 2120                      | 170                        | 5.0                         | 12.2       |
|                                                                                                                        | 6.20       | 40                        | 0.085     | 2055                      | 175                        | 5.5                         | 14.1       |
|                                                                                                                        | 6.50       | 40                        | 0.085     | 1960                      | 165                        | 5.5                         | 14.9       |
|                                                                                                                        | 6.80       | 40                        | 0.090     | 1870                      | 170                        | 6.0                         | 14.4       |
|                                                                                                                        | 7.00       | 40                        | 0.095     | 1820                      | 175                        | 6.5                         | 14.0       |
|                                                                                                                        | 7.20       | 40                        | 0.095     | 1770                      | 170                        | 7.0                         | 14.3       |
|                                                                                                                        | 7.40       | 40                        | 0.100     | 1720                      | 170                        | 7.5                         | 14.3       |
|                                                                                                                        | 7.50       | 40                        | 0.100     | 1700                      | 170                        | 7.5                         | 14.3       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 5.80       | 60                        | 0.090     | 3295                      | 295                        | 8.0                         | 7.0        |
|                                                                                                                        | 6.00       | 60                        | 0.090     | 3185                      | 285                        | 8.0                         | 7.3        |
|                                                                                                                        | 6.20       | 60                        | 0.095     | 3080                      | 295                        | 9.0                         | 8.4        |
|                                                                                                                        | 6.50       | 60                        | 0.100     | 2940                      | 295                        | 10.0                        | 8.3        |
|                                                                                                                        | 6.80       | 60                        | 0.105     | 2810                      | 295                        | 10.5                        | 8.3        |
|                                                                                                                        | 7.00       | 60                        | 0.110     | 2730                      | 300                        | 11.5                        | 8.1        |
|                                                                                                                        | 7.20       | 60                        | 0.110     | 2655                      | 290                        | 12.0                        | 8.4        |
|                                                                                                                        | 7.40       | 60                        | 0.115     | 2580                      | 295                        | 12.5                        | 8.2        |
|                                                                                                                        | 7.50       | 60                        | 0.115     | 2545                      | 295                        | 13.0                        | 8.2        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 5.80       | 220                       | 0.165     | 12075                     | 1990                       | 52.5                        | 1.0        |
|                                                                                                                        | 6.00       | 220                       | 0.170     | 11670                     | 1985                       | 56.0                        | 1.0        |
|                                                                                                                        | 6.20       | 220                       | 0.175     | 11295                     | 1975                       | 59.5                        | 1.3        |
|                                                                                                                        | 6.50       | 220                       | 0.185     | 10775                     | 1995                       | 66.0                        | 1.2        |
|                                                                                                                        | 6.80       | 220                       | 0.195     | 10300                     | 2010                       | 73.0                        | 1.2        |
|                                                                                                                        | 7.00       | 220                       | 0.200     | 10005                     | 2000                       | 77.0                        | 1.2        |
|                                                                                                                        | 7.20       | 220                       | 0.205     | 9725                      | 1995                       | 81.0                        | 1.2        |
|                                                                                                                        | 7.40       | 220                       | 0.210     | 9465                      | 1990                       | 85.5                        | 1.2        |
|                                                                                                                        | 7.50       | 220                       | 0.215     | 9335                      | 2005                       | 88.5                        | 1.2        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aluminium corroyé<br>Si < 6%                                                                                           | 5.80       | 250                       | 0.130     | 13720                     | 1785                       | 47.0                        | 1.2        |
|                                                                                                                        | 6.00       | 250                       | 0.135     | 13265                     | 1790                       | 50.5                        | 1.2        |
|                                                                                                                        | 6.20       | 250                       | 0.140     | 12835                     | 1795                       | 54.0                        | 1.4        |
|                                                                                                                        | 6.50       | 250                       | 0.145     | 12245                     | 1775                       | 59.0                        | 1.4        |
|                                                                                                                        | 6.80       | 250                       | 0.150     | 11705                     | 1755                       | 63.5                        | 1.4        |
|                                                                                                                        | 7.00       | 250                       | 0.155     | 11370                     | 1760                       | 67.5                        | 1.4        |
|                                                                                                                        | 7.20       | 250                       | 0.160     | 11050                     | 1770                       | 72.0                        | 1.4        |
|                                                                                                                        | 7.40       | 250                       | 0.165     | 10755                     | 1775                       | 76.5                        | 1.4        |
|                                                                                                                        | 7.50       | 250                       | 0.165     | 10610                     | 1750                       | 77.5                        | 1.4        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

# Forets hélicoïdaux Supradrill® U

5xd

HM  
MG10



Rm  
< 850

Rm  
850-1100

Rm  
1100-1300

Rm  
1300-1500

Inox  
Stainless

GG(G)  
Aluminium

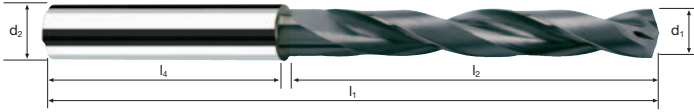
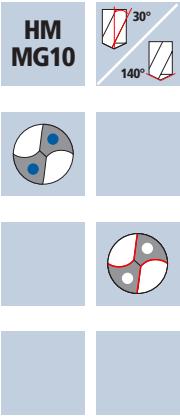
| Exemple:<br>N° cde     |          |          |    |    |    |                  | NANO-U <sup>2</sup> |   |
|------------------------|----------|----------|----|----|----|------------------|---------------------|---|
| N° d'article<br>Code-ø |          |          |    |    |    |                  | B62015              |   |
| B62015 .0570           |          |          |    |    |    |                  | B63015              |   |
| ø<br>Code              | d1<br>m7 | d2<br>h6 | l1 | l2 | l4 | L <sub>max</sub> |                     |   |
| .0570                  | 5.70     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |
| .0575                  | 5.75     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |
| .0580                  | 5.80     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |
| .0590                  | 5.90     | 6        | 82 | 44 | 36 | 34.5             |                     | ● |
| .0600                  | 6.00     | 6        | 82 | 44 | 36 | 34.5             |                     | ● |
| .0610                  | 6.10     | 8        | 91 | 53 | 36 | 41.4             |                     | ● |
| .0620                  | 6.20     | 8        | 91 | 53 | 36 | 41.2             |                     | ● |
| .0630                  | 6.30     | 8        | 91 | 53 | 36 | 41.2             |                     | ● |
| .0640                  | 6.40     | 8        | 91 | 53 | 36 | 41.1             |                     | ● |
| .0650                  | 6.50     | 8        | 91 | 53 | 36 | 41.1             |                     | ● |
| .0660                  | 6.60     | 8        | 91 | 53 | 36 | 41.0             |                     | ● |
| .0670                  | 6.70     | 8        | 91 | 53 | 36 | 41.0             |                     | ● |
| .0680                  | 6.80     | 8        | 91 | 53 | 36 | 40.9             |                     | ● |
| .0690                  | 6.90     | 8        | 91 | 53 | 36 | 40.9             |                     | ● |
| .0700                  | 7.00     | 8        | 91 | 53 | 36 | 40.7             |                     | ● |
| .0710                  | 7.10     | 8        | 91 | 53 | 36 | 40.7             |                     | ● |
| .0720                  | 7.20     | 8        | 91 | 53 | 36 | 40.6             |                     | ● |
| .0725                  | 7.25     | 8        | 91 | 53 | 36 | 40.6             |                     | ● |
| .0730                  | 7.30     | 8        | 91 | 53 | 36 | 40.6             |                     | ● |
| .0740                  | 7.40     | 8        | 91 | 53 | 36 | 40.5             |                     | ● |
| .0745                  | 7.45     | 8        | 91 | 53 | 36 | 40.4             |                     | ● |
| .0750                  | 7.50     | 8        | 91 | 53 | 36 | 40.5             |                     | ● |
| .0755                  | 7.55     | 8        | 91 | 53 | 36 | 40.4             |                     | ● |

| Application                                                                       | Matières                                | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>       | 7.60       | 170                       | 0.200     | 7120                      | 1425                       | 64.5                        | 1.7        |
|                                                                                   |                                         | 7.80       | 170                       | 0.205     | 6940                      | 1425                       | 68.0                        | 1.7        |
|                                                                                   |                                         | 8.00       | 170                       | 0.210     | 6765                      | 1420                       | 71.5                        | 1.7        |
|                                                                                   |                                         | 8.20       | 170                       | 0.215     | 6600                      | 1420                       | 75.0                        | 2.0        |
|                                                                                   |                                         | 8.50       | 170                       | 0.225     | 6365                      | 1430                       | 81.0                        | 1.9        |
|                                                                                   |                                         | 8.80       | 170                       | 0.230     | 6150                      | 1415                       | 86.0                        | 1.9        |
|                                                                                   |                                         | 9.00       | 170                       | 0.235     | 6015                      | 1415                       | 90.0                        | 1.9        |
|                                                                                   |                                         | 9.20       | 170                       | 0.240     | 5880                      | 1410                       | 93.5                        | 1.9        |
|                                                                                   |                                         | 9.40       | 170                       | 0.245     | 5755                      | 1410                       | 98.0                        | 1.9        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm <sup>2</sup>   | 7.60       | 130                       | 0.200     | 5445                      | 1090                       | 49.5                        | 2.2        |
|                                                                                   |                                         | 7.80       | 130                       | 0.205     | 5305                      | 1090                       | 52.0                        | 2.2        |
|                                                                                   |                                         | 8.00       | 130                       | 0.210     | 5175                      | 1085                       | 54.5                        | 2.2        |
|                                                                                   |                                         | 8.20       | 130                       | 0.215     | 5045                      | 1085                       | 57.5                        | 2.6        |
|                                                                                   |                                         | 8.50       | 130                       | 0.225     | 4870                      | 1095                       | 62.0                        | 2.5        |
|                                                                                   |                                         | 8.80       | 130                       | 0.230     | 4700                      | 1080                       | 65.5                        | 2.6        |
|                                                                                   |                                         | 9.00       | 130                       | 0.235     | 4600                      | 1080                       | 68.5                        | 2.5        |
|                                                                                   |                                         | 9.20       | 130                       | 0.240     | 4500                      | 1080                       | 72.0                        | 2.5        |
|                                                                                   |                                         | 9.40       | 130                       | 0.245     | 4400                      | 1080                       | 75.0                        | 2.5        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | 7.60       | 110                       | 0.150     | 4605                      | 690                        | 31.5                        | 3.5        |
|                                                                                   |                                         | 7.80       | 110                       | 0.155     | 4490                      | 695                        | 33.0                        | 3.5        |
|                                                                                   |                                         | 8.00       | 110                       | 0.160     | 4375                      | 700                        | 35.0                        | 3.5        |
|                                                                                   |                                         | 8.20       | 110                       | 0.165     | 4270                      | 705                        | 37.0                        | 3.9        |
|                                                                                   |                                         | 8.50       | 110                       | 0.170     | 4120                      | 700                        | 39.5                        | 3.9        |
|                                                                                   |                                         | 8.80       | 110                       | 0.175     | 3980                      | 695                        | 42.5                        | 4.0        |
|                                                                                   |                                         | 9.00       | 110                       | 0.180     | 3890                      | 700                        | 44.5                        | 3.9        |
|                                                                                   |                                         | 9.20       | 110                       | 0.185     | 3805                      | 705                        | 47.0                        | 3.9        |
|                                                                                   |                                         | 9.40       | 110                       | 0.190     | 3725                      | 710                        | 49.5                        | 3.8        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm <sup>2</sup> | 7.60       | 70                        | 0.125     | 2930                      | 365                        | 16.5                        | 6.6        |
|                                                                                   |                                         | 7.80       | 70                        | 0.130     | 2855                      | 370                        | 17.5                        | 6.6        |
|                                                                                   |                                         | 8.00       | 70                        | 0.135     | 2785                      | 375                        | 19.0                        | 6.5        |
|                                                                                   |                                         | 8.20       | 70                        | 0.135     | 2715                      | 365                        | 19.5                        | 7.6        |
|                                                                                   |                                         | 8.50       | 70                        | 0.140     | 2620                      | 365                        | 20.5                        | 7.6        |
|                                                                                   |                                         | 8.80       | 70                        | 0.145     | 2530                      | 365                        | 22.0                        | 7.5        |
|                                                                                   |                                         | 9.00       | 70                        | 0.150     | 2475                      | 370                        | 23.5                        | 7.4        |
|                                                                                   |                                         | 9.20       | 70                        | 0.155     | 2420                      | 375                        | 25.0                        | 7.3        |
|                                                                                   |                                         | 9.40       | 70                        | 0.155     | 2370                      | 365                        | 25.5                        | 7.5        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm <sup>2</sup>                                                                                | 7.60       | 40                        | 0.100     | 1675                      | 170                        | 7.5                         | 14.3       |
|                                                                                                                        | 7.80       | 40                        | 0.105     | 1630                      | 170                        | 8.0                         | 14.3       |
|                                                                                                                        | 8.00       | 40                        | 0.105     | 1590                      | 165                        | 8.5                         | 14.7       |
|                                                                                                                        | 8.20       | 40                        | 0.110     | 1555                      | 170                        | 9.0                         | 16.3       |
|                                                                                                                        | 8.50       | 40                        | 0.115     | 1500                      | 175                        | 10.0                        | 15.8       |
|                                                                                                                        | 8.80       | 40                        | 0.115     | 1445                      | 165                        | 10.0                        | 16.7       |
|                                                                                                                        | 9.00       | 40                        | 0.120     | 1415                      | 170                        | 11.0                        | 16.1       |
|                                                                                                                        | 9.20       | 40                        | 0.125     | 1385                      | 175                        | 11.5                        | 15.6       |
|                                                                                                                        | 9.40       | 40                        | 0.125     | 1355                      | 170                        | 12.0                        | 16.1       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 7.60       | 60                        | 0.115     | 2515                      | 290                        | 13.0                        | 8.4        |
|                                                                                                                        | 7.80       | 60                        | 0.120     | 2450                      | 295                        | 14.0                        | 8.2        |
|                                                                                                                        | 8.00       | 60                        | 0.125     | 2385                      | 300                        | 15.0                        | 8.1        |
|                                                                                                                        | 8.20       | 60                        | 0.125     | 2330                      | 290                        | 15.5                        | 9.6        |
|                                                                                                                        | 8.50       | 60                        | 0.130     | 2245                      | 290                        | 16.5                        | 9.5        |
|                                                                                                                        | 8.80       | 60                        | 0.135     | 2170                      | 295                        | 18.0                        | 9.3        |
|                                                                                                                        | 9.00       | 60                        | 0.140     | 2120                      | 295                        | 19.0                        | 9.3        |
|                                                                                                                        | 9.20       | 60                        | 0.140     | 2075                      | 290                        | 19.5                        | 9.4        |
|                                                                                                                        | 9.40       | 60                        | 0.145     | 2030                      | 295                        | 20.5                        | 9.3        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 7.60       | 220                       | 0.215     | 9215                      | 1980                       | 90.0                        | 1.2        |
|                                                                                                                        | 7.80       | 220                       | 0.225     | 8980                      | 2020                       | 96.5                        | 1.2        |
|                                                                                                                        | 8.00       | 220                       | 0.230     | 8755                      | 2015                       | 101.5                       | 1.2        |
|                                                                                                                        | 8.20       | 220                       | 0.235     | 8540                      | 2005                       | 106.0                       | 1.4        |
|                                                                                                                        | 8.50       | 220                       | 0.245     | 8240                      | 2020                       | 114.5                       | 1.4        |
|                                                                                                                        | 8.80       | 220                       | 0.250     | 7960                      | 1990                       | 121.0                       | 1.4        |
|                                                                                                                        | 9.00       | 220                       | 0.255     | 7780                      | 1985                       | 126.5                       | 1.4        |
|                                                                                                                        | 9.20       | 220                       | 0.265     | 7610                      | 2015                       | 134.0                       | 1.4        |
|                                                                                                                        | 9.40       | 220                       | 0.270     | 7450                      | 2010                       | 139.5                       | 1.4        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aluminium corroyé<br>Si < 6%                                                                                           | 7.60       | 250                       | 0.170     | 10470                     | 1780                       | 80.5                        | 1.4        |
|                                                                                                                        | 7.80       | 250                       | 0.175     | 10200                     | 1785                       | 85.5                        | 1.4        |
|                                                                                                                        | 8.00       | 250                       | 0.180     | 9945                      | 1790                       | 90.0                        | 1.4        |
|                                                                                                                        | 8.20       | 250                       | 0.180     | 9705                      | 1745                       | 92.0                        | 1.6        |
|                                                                                                                        | 8.50       | 250                       | 0.190     | 9360                      | 1780                       | 101.0                       | 1.6        |
|                                                                                                                        | 8.80       | 250                       | 0.195     | 9045                      | 1765                       | 107.5                       | 1.6        |
|                                                                                                                        | 9.00       | 250                       | 0.200     | 8840                      | 1770                       | 112.5                       | 1.5        |
|                                                                                                                        | 9.20       | 250                       | 0.205     | 8650                      | 1775                       | 118.0                       | 1.5        |
|                                                                                                                        | 9.40       | 250                       | 0.210     | 8465                      | 1780                       | 123.5                       | 1.5        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

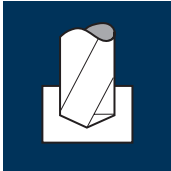
# Forets hélicoïdaux Supradrill® U

5xd



|             |                |                 |                 |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|

| Exemple: N° cde     |          |          |     |    |    |                  | NANO-U <sup>2</sup> |   |
|---------------------|----------|----------|-----|----|----|------------------|---------------------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | B62015              |   |
| B62015 .0760        |          |          |     |    |    |                  | B63015              |   |
| ø<br>Code           | d1<br>m7 | d2<br>h6 | l1  | l2 | l4 | L <sub>max</sub> |                     |   |
| .0760               | 7.60     | 8        | 91  | 53 | 36 | 40.4             |                     | ● |
| .0765               | 7.65     | 8        | 91  | 53 | 36 | 40.4             |                     | ● |
| .0770               | 7.70     | 8        | 91  | 53 | 36 | 40.4             |                     | ● |
| .0780               | 7.80     | 8        | 91  | 53 | 36 | 40.4             |                     | ● |
| .0790               | 7.90     | 8        | 91  | 53 | 36 | 40.4             |                     | ● |
| .0800               | 8.00     | 8        | 91  | 53 | 36 | 40.4             |                     | ● |
| .0810               | 8.10     | 10       | 103 | 61 | 40 | 46.3             |                     | ● |
| .0820               | 8.20     | 10       | 103 | 61 | 40 | 46.2             |                     | ● |
| .0830               | 8.30     | 10       | 103 | 61 | 40 | 46.2             |                     | ● |
| .0840               | 8.40     | 10       | 103 | 61 | 40 | 46.1             |                     | ● |
| .0850               | 8.50     | 10       | 103 | 61 | 40 | 46.1             |                     | ● |
| .0860               | 8.60     | 10       | 103 | 61 | 40 | 46.0             |                     | ● |
| .0870               | 8.70     | 10       | 103 | 61 | 40 | 46.0             |                     | ● |
| .0875               | 8.75     | 10       | 103 | 61 | 40 | 45.9             |                     | ● |
| .0880               | 8.80     | 10       | 103 | 61 | 40 | 45.9             |                     | ● |
| .0885               | 8.85     | 10       | 103 | 61 | 40 | 45.8             |                     | ● |
| .0890               | 8.90     | 10       | 103 | 61 | 40 | 45.8             |                     | ● |
| .0900               | 9.00     | 10       | 103 | 61 | 40 | 45.7             |                     | ● |
| .0910               | 9.10     | 10       | 103 | 61 | 40 | 45.7             |                     | ● |
| .0920               | 9.20     | 10       | 103 | 61 | 40 | 45.6             |                     | ● |
| .0925               | 9.25     | 10       | 103 | 61 | 40 | 45.5             |                     | ● |
| .0930               | 9.30     | 10       | 103 | 61 | 40 | 45.6             |                     | ● |
| .0940               | 9.40     | 10       | 103 | 61 | 40 | 45.5             |                     | ● |

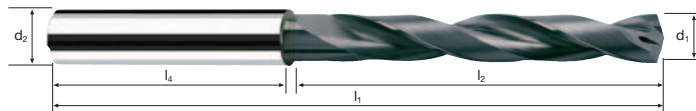
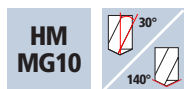
| Application                                                                      | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²       | 9.50       | 170                       | 0.250     | 5695                      | 1425                       | 101.0                       | 1.9        |
|                                                                                  |                             | 9.60       | 170                       | 0.255     | 5635                      | 1435                       | 104.0                       | 1.9        |
|                                                                                  |                             | 9.80       | 170                       | 0.260     | 5520                      | 1435                       | 108.0                       | 1.9        |
|                                                                                  |                             | 10.00      | 170                       | 0.265     | 5410                      | 1435                       | 112.5                       | 1.9        |
|                                                                                  |                             | 10.20      | 170                       | 0.270     | 5305                      | 1430                       | 117.0                       | 2.2        |
|                                                                                  |                             | 10.50      | 170                       | 0.275     | 5155                      | 1420                       | 123.0                       | 2.2        |
|                                                                                  |                             | 10.80      | 170                       | 0.285     | 5010                      | 1430                       | 131.0                       | 2.2        |
|                                                                                  |                             | 11.00      | 170                       | 0.290     | 4920                      | 1425                       | 135.5                       | 2.2        |
|                                                                                  |                             | 11.50      | 170                       | 0.305     | 4705                      | 1435                       | 149.0                       | 2.2        |
|                                                                                  |                             |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>500 - 850 N/mm²   | 9.50       | 130                       | 0.250     | 4355                      | 1090                       | 77.5                        | 2.5        |
|                                                                                  |                             | 9.60       | 130                       | 0.255     | 4310                      | 1100                       | 79.5                        | 2.5        |
|                                                                                  |                             | 9.80       | 130                       | 0.260     | 4220                      | 1095                       | 82.5                        | 2.5        |
|                                                                                  |                             | 10.00      | 130                       | 0.265     | 4140                      | 1095                       | 86.0                        | 2.5        |
|                                                                                  |                             | 10.20      | 130                       | 0.270     | 4055                      | 1095                       | 89.5                        | 2.9        |
|                                                                                  |                             | 10.50      | 130                       | 0.275     | 3940                      | 1085                       | 94.0                        | 2.9        |
|                                                                                  |                             | 10.80      | 130                       | 0.285     | 3830                      | 1090                       | 100.0                       | 2.9        |
|                                                                                  |                             | 11.00      | 130                       | 0.290     | 3760                      | 1090                       | 103.5                       | 2.9        |
|                                                                                  |                             | 11.50      | 130                       | 0.305     | 3600                      | 1100                       | 114.5                       | 2.9        |
|                                                                                  |                             |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>850 - 1100 N/mm²  | 9.50       | 110                       | 0.190     | 3685                      | 700                        | 49.5                        | 3.9        |
|                                                                                  |                             | 9.60       | 110                       | 0.190     | 3645                      | 695                        | 50.5                        | 3.9        |
|                                                                                  |                             | 9.80       | 110                       | 0.195     | 3575                      | 695                        | 52.5                        | 3.9        |
|                                                                                  |                             | 10.00      | 110                       | 0.200     | 3500                      | 700                        | 55.0                        | 3.9        |
|                                                                                  |                             | 10.20      | 110                       | 0.205     | 3435                      | 705                        | 57.5                        | 4.5        |
|                                                                                  |                             | 10.50      | 110                       | 0.210     | 3335                      | 700                        | 60.5                        | 4.5        |
|                                                                                  |                             | 10.80      | 110                       | 0.215     | 3240                      | 695                        | 63.5                        | 4.6        |
|                                                                                  |                             | 11.00      | 110                       | 0.220     | 3185                      | 700                        | 66.5                        | 4.5        |
|                                                                                  |                             | 11.50      | 110                       | 0.230     | 3045                      | 700                        | 72.5                        | 4.5        |
|                                                                                  |                             |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>1100 - 1300 N/mm² | 9.50       | 70                        | 0.160     | 2345                      | 375                        | 26.5                        | 7.3        |
|                                                                                  |                             | 9.60       | 70                        | 0.160     | 2320                      | 370                        | 27.0                        | 7.4        |
|                                                                                  |                             | 9.80       | 70                        | 0.165     | 2275                      | 375                        | 28.5                        | 7.2        |
|                                                                                  |                             | 10.00      | 70                        | 0.165     | 2230                      | 370                        | 29.0                        | 7.4        |
|                                                                                  |                             | 10.20      | 70                        | 0.170     | 2185                      | 370                        | 30.0                        | 8.6        |
|                                                                                  |                             | 10.50      | 70                        | 0.175     | 2120                      | 370                        | 32.0                        | 8.6        |
|                                                                                  |                             | 10.80      | 70                        | 0.180     | 2065                      | 370                        | 34.0                        | 8.6        |
|                                                                                  |                             | 11.00      | 70                        | 0.185     | 2025                      | 375                        | 35.5                        | 8.4        |
|                                                                                  |                             | 11.50      | 70                        | 0.190     | 1940                      | 370                        | 38.5                        | 8.5        |
|                                                                                  |                             |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 9.50       | 40                        | 0.125     | 1340                      | 170                        | 12.0                        | 16.0       |
|                                                                                                                        | 9.60       | 40                        | 0.130     | 1325                      | 170                        | 12.5                        | 16.0       |
|                                                                                                                        | 9.80       | 40                        | 0.130     | 1300                      | 170                        | 13.0                        | 16.0       |
|                                                                                                                        | 10.00      | 40                        | 0.135     | 1275                      | 170                        | 13.5                        | 16.0       |
|                                                                                                                        | 10.20      | 40                        | 0.135     | 1250                      | 170                        | 14.0                        | 18.8       |
|                                                                                                                        | 10.50      | 40                        | 0.140     | 1215                      | 170                        | 14.5                        | 18.7       |
|                                                                                                                        | 10.80      | 40                        | 0.145     | 1180                      | 170                        | 15.5                        | 18.6       |
|                                                                                                                        | 11.00      | 40                        | 0.145     | 1155                      | 165                        | 15.5                        | 19.2       |
|                                                                                                                        | 11.50      | 40                        | 0.155     | 1105                      | 170                        | 17.5                        | 18.5       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 9.50       | 60                        | 0.145     | 2010                      | 290                        | 20.5                        | 9.4        |
|                                                                                                                        | 9.60       | 60                        | 0.150     | 1990                      | 300                        | 21.5                        | 9.1        |
|                                                                                                                        | 9.80       | 60                        | 0.150     | 1950                      | 295                        | 22.5                        | 9.2        |
|                                                                                                                        | 10.00      | 60                        | 0.155     | 1910                      | 295                        | 23.0                        | 9.2        |
|                                                                                                                        | 10.20      | 60                        | 0.155     | 1870                      | 290                        | 23.5                        | 11.0       |
|                                                                                                                        | 10.50      | 60                        | 0.160     | 1820                      | 290                        | 25.0                        | 11.0       |
|                                                                                                                        | 10.80      | 60                        | 0.165     | 1770                      | 290                        | 26.5                        | 10.9       |
|                                                                                                                        | 11.00      | 60                        | 0.170     | 1735                      | 295                        | 28.0                        | 10.7       |
|                                                                                                                        | 11.50      | 60                        | 0.175     | 1660                      | 290                        | 30.0                        | 10.8       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 9.50       | 220                       | 0.270     | 7370                      | 1990                       | 141.0                       | 1.4        |
|                                                                                                                        | 9.60       | 220                       | 0.275     | 7295                      | 2005                       | 145.0                       | 1.4        |
|                                                                                                                        | 9.80       | 220                       | 0.280     | 7145                      | 2000                       | 151.0                       | 1.4        |
|                                                                                                                        | 10.00      | 220                       | 0.285     | 7005                      | 1995                       | 156.5                       | 1.4        |
|                                                                                                                        | 10.20      | 220                       | 0.290     | 6865                      | 1990                       | 162.5                       | 1.6        |
|                                                                                                                        | 10.50      | 220                       | 0.300     | 6670                      | 2000                       | 173.0                       | 1.6        |
|                                                                                                                        | 10.80      | 220                       | 0.310     | 6485                      | 2010                       | 184.0                       | 1.6        |
|                                                                                                                        | 11.00      | 220                       | 0.315     | 6365                      | 2005                       | 190.5                       | 1.6        |
|                                                                                                                        | 11.50      | 220                       | 0.330     | 6090                      | 2010                       | 209.0                       | 1.6        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aluminium corroyé<br>Si < 6%                                                                                           | 9.50       | 250                       | 0.210     | 8375                      | 1760                       | 125.0                       | 1.5        |
|                                                                                                                        | 9.60       | 250                       | 0.215     | 8290                      | 1780                       | 129.0                       | 1.5        |
|                                                                                                                        | 9.80       | 250                       | 0.220     | 8120                      | 1785                       | 134.5                       | 1.5        |
|                                                                                                                        | 10.00      | 250                       | 0.220     | 7960                      | 1750                       | 137.5                       | 1.6        |
|                                                                                                                        | 10.20      | 250                       | 0.225     | 7800                      | 1755                       | 143.5                       | 1.8        |
|                                                                                                                        | 10.50      | 250                       | 0.235     | 7580                      | 1780                       | 154.0                       | 1.8        |
|                                                                                                                        | 10.80      | 250                       | 0.240     | 7370                      | 1770                       | 162.0                       | 1.8        |
|                                                                                                                        | 11.00      | 250                       | 0.245     | 7235                      | 1775                       | 168.5                       | 1.8        |
|                                                                                                                        | 11.50      | 250                       | 0.255     | 6920                      | 1765                       | 183.5                       | 1.8        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |



# Forets hélicoïdaux Supradrill® U

5xd



|                    |                       |                        |                        |  |  |  |                          |  |                           |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|--|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 |  |  |  | <b>Inox</b><br>Stainless |  | <b>GG(G)</b><br>Aluminium |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|--|---------------------------|

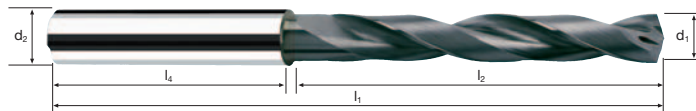
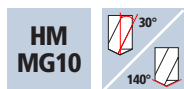
| Exemple:<br>N° cde <div>                         N° d'article<br/> <b>B62015</b> </div> <div>                         Code-ø<br/> <b>.0950</b> </div> |          |          |     |    |    |                  | <div> </div> <div> </div> |  | NANO-U <sup>2</sup> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|-----|----|----|------------------|---------------------------|--|---------------------|
| ø<br>Code                                                                                                                                             | d1<br>m7 | d2<br>h6 | l1  | l2 | l4 | L <sub>max</sub> |                           |  |                     |
| .0950                                                                                                                                                 | 9.50     | 10       | 103 | 61 | 40 | 45.5             |                           |  | ●                   |
| .0955                                                                                                                                                 | 9.55     | 10       | 103 | 61 | 40 | 45.4             |                           |  | ●                   |
| .0960                                                                                                                                                 | 9.60     | 10       | 103 | 61 | 40 | 45.4             |                           |  | ●                   |
| .0965                                                                                                                                                 | 9.65     | 10       | 103 | 61 | 40 | 45.3             |                           |  | ●                   |
| .0970                                                                                                                                                 | 9.70     | 10       | 103 | 61 | 40 | 45.4             |                           |  | ●                   |
| .0980                                                                                                                                                 | 9.80     | 10       | 103 | 61 | 40 | 45.3             |                           |  | ●                   |
| .0990                                                                                                                                                 | 9.90     | 10       | 103 | 61 | 40 | 45.4             |                           |  | ●                   |
| .1000                                                                                                                                                 | 10.00    | 10       | 103 | 61 | 40 | 45.4             |                           |  | ●                   |
| .1010                                                                                                                                                 | 10.10    | 12       | 118 | 71 | 45 | 53.3             |                           |  | ●                   |
| .1020                                                                                                                                                 | 10.20    | 12       | 118 | 71 | 45 | 53.2             |                           |  | ●                   |
| .1030                                                                                                                                                 | 10.30    | 12       | 118 | 71 | 45 | 53.2             |                           |  | ●                   |
| .1040                                                                                                                                                 | 10.40    | 12       | 118 | 71 | 45 | 53.1             |                           |  | ●                   |
| .1050                                                                                                                                                 | 10.50    | 12       | 118 | 71 | 45 | 53.1             |                           |  | ●                   |
| .1060                                                                                                                                                 | 10.60    | 12       | 118 | 71 | 45 | 53.0             |                           |  | ●                   |
| .1070                                                                                                                                                 | 10.70    | 12       | 118 | 71 | 45 | 52.9             |                           |  | ●                   |
| .1080                                                                                                                                                 | 10.80    | 12       | 118 | 71 | 45 | 52.8             |                           |  | ●                   |
| .1090                                                                                                                                                 | 10.90    | 12       | 118 | 71 | 45 | 52.8             |                           |  | ●                   |
| .1100                                                                                                                                                 | 11.00    | 12       | 118 | 71 | 45 | 52.7             |                           |  | ●                   |
| .1110                                                                                                                                                 | 11.10    | 12       | 118 | 71 | 45 | 52.7             |                           |  | ●                   |
| .1120                                                                                                                                                 | 11.20    | 12       | 118 | 71 | 45 | 52.6             |                           |  | ●                   |
| .1130                                                                                                                                                 | 11.30    | 12       | 118 | 71 | 45 | 52.6             |                           |  | ●                   |
| .1140                                                                                                                                                 | 11.40    | 12       | 118 | 71 | 45 | 52.5             |                           |  | ●                   |
| .1150                                                                                                                                                 | 11.50    | 12       | 118 | 71 | 45 | 52.4             |                           |  | ●                   |

| Application                                                                       | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²       | 11.80      | 170                       | 0.310     | 4585                      | 1420                       | 155.5                       | 2.2        |
|                                                                                   |                             | 12.00      | 170                       | 0.315     | 4510                      | 1420                       | 160.5                       | 2.2        |
|                                                                                   |                             | 12.20      | 170                       | 0.320     | 4435                      | 1420                       | 166.0                       | 2.4        |
|                                                                                   |                             | 12.50      | 170                       | 0.330     | 4330                      | 1430                       | 175.5                       | 2.4        |
|                                                                                   |                             | 12.80      | 170                       | 0.335     | 4230                      | 1415                       | 182.0                       | 2.4        |
|                                                                                   |                             | 13.00      | 170                       | 0.340     | 4165                      | 1415                       | 188.0                       | 2.4        |
|                                                                                   |                             | 13.20      | 170                       | 0.345     | 4100                      | 1415                       | 193.5                       | 2.4        |
|                                                                                   |                             | 13.50      | 170                       | 0.355     | 4010                      | 1425                       | 204.0                       | 2.3        |
|                                                                                   |                             | 13.80      | 170                       | 0.365     | 3920                      | 1430                       | 214.0                       | 2.3        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm²   | 11.80      | 130                       | 0.310     | 3505                      | 1085                       | 118.5                       | 2.9        |
|                                                                                   |                             | 12.00      | 130                       | 0.315     | 3450                      | 1085                       | 122.5                       | 2.9        |
|                                                                                   |                             | 12.20      | 130                       | 0.320     | 3390                      | 1085                       | 127.0                       | 3.1        |
|                                                                                   |                             | 12.50      | 130                       | 0.330     | 3310                      | 1090                       | 134.0                       | 3.1        |
|                                                                                   |                             | 12.80      | 130                       | 0.335     | 3235                      | 1085                       | 139.5                       | 3.1        |
|                                                                                   |                             | 13.00      | 130                       | 0.340     | 3185                      | 1085                       | 144.0                       | 3.1        |
|                                                                                   |                             | 13.20      | 130                       | 0.345     | 3135                      | 1080                       | 148.0                       | 3.1        |
|                                                                                   |                             | 13.50      | 130                       | 0.355     | 3065                      | 1090                       | 156.0                       | 3.0        |
|                                                                                   |                             | 13.80      | 130                       | 0.365     | 3000                      | 1095                       | 164.0                       | 3.0        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | 11.80      | 110                       | 0.235     | 2965                      | 695                        | 76.0                        | 4.5        |
|                                                                                   |                             | 12.00      | 110                       | 0.240     | 2920                      | 700                        | 79.0                        | 4.5        |
|                                                                                   |                             | 12.20      | 110                       | 0.245     | 2870                      | 705                        | 82.5                        | 4.8        |
|                                                                                   |                             | 12.50      | 110                       | 0.250     | 2800                      | 700                        | 86.0                        | 4.8        |
|                                                                                   |                             | 12.80      | 110                       | 0.255     | 2735                      | 695                        | 89.5                        | 4.8        |
|                                                                                   |                             | 13.00      | 110                       | 0.260     | 2695                      | 700                        | 93.0                        | 4.8        |
|                                                                                   |                             | 13.20      | 110                       | 0.265     | 2655                      | 705                        | 96.5                        | 4.7        |
|                                                                                   |                             | 13.50      | 110                       | 0.270     | 2595                      | 700                        | 100.0                       | 4.7        |
|                                                                                   |                             | 13.80      | 110                       | 0.275     | 2535                      | 695                        | 104.0                       | 4.8        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm² | 11.80      | 70                        | 0.195     | 1890                      | 370                        | 40.5                        | 8.5        |
|                                                                                   |                             | 12.00      | 70                        | 0.200     | 1855                      | 370                        | 42.0                        | 8.5        |
|                                                                                   |                             | 12.20      | 70                        | 0.205     | 1825                      | 375                        | 44.0                        | 9.0        |
|                                                                                   |                             | 12.50      | 70                        | 0.210     | 1785                      | 375                        | 46.0                        | 9.0        |
|                                                                                   |                             | 12.80      | 70                        | 0.215     | 1740                      | 375                        | 48.5                        | 8.9        |
|                                                                                   |                             | 13.00      | 70                        | 0.215     | 1715                      | 370                        | 49.0                        | 9.0        |
|                                                                                   |                             | 13.20      | 70                        | 0.220     | 1690                      | 370                        | 50.5                        | 9.0        |
|                                                                                   |                             | 13.50      | 70                        | 0.225     | 1650                      | 370                        | 53.0                        | 9.0        |
|                                                                                   |                             | 13.80      | 70                        | 0.230     | 1615                      | 370                        | 55.5                        | 9.0        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 11.80      | 40                        | 0.155     | 1080                      | 165                        | 18.0                        | 19.0       |
|                                                                                                                        | 12.00      | 40                        | 0.160     | 1060                      | 170                        | 19.0                        | 18.5       |
|                                                                                                                        | 12.20      | 40                        | 0.165     | 1045                      | 170                        | 20.0                        | 19.8       |
|                                                                                                                        | 12.50      | 40                        | 0.165     | 1020                      | 170                        | 21.0                        | 19.8       |
|                                                                                                                        | 12.80      | 40                        | 0.170     | 995                       | 170                        | 22.0                        | 19.7       |
|                                                                                                                        | 13.00      | 40                        | 0.175     | 980                       | 170                        | 22.5                        | 19.7       |
|                                                                                                                        | 13.20      | 40                        | 0.175     | 965                       | 170                        | 23.5                        | 19.6       |
|                                                                                                                        | 13.50      | 40                        | 0.180     | 945                       | 170                        | 24.5                        | 19.5       |
|                                                                                                                        | 13.80      | 40                        | 0.185     | 925                       | 170                        | 25.5                        | 19.5       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 11.80      | 60                        | 0.180     | 1620                      | 290                        | 31.5                        | 10.8       |
|                                                                                                                        | 12.00      | 60                        | 0.185     | 1590                      | 295                        | 33.5                        | 10.6       |
|                                                                                                                        | 12.20      | 60                        | 0.190     | 1565                      | 295                        | 34.5                        | 11.4       |
|                                                                                                                        | 12.50      | 60                        | 0.190     | 1530                      | 290                        | 35.5                        | 11.6       |
|                                                                                                                        | 12.80      | 60                        | 0.195     | 1490                      | 290                        | 37.5                        | 11.5       |
|                                                                                                                        | 13.00      | 60                        | 0.200     | 1470                      | 295                        | 39.0                        | 11.3       |
|                                                                                                                        | 13.20      | 60                        | 0.205     | 1445                      | 295                        | 40.5                        | 11.3       |
|                                                                                                                        | 13.50      | 60                        | 0.210     | 1415                      | 295                        | 42.0                        | 11.3       |
|                                                                                                                        | 13.80      | 60                        | 0.210     | 1385                      | 290                        | 43.5                        | 11.4       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 11.80      | 220                       | 0.335     | 5935                      | 1990                       | 217.5                       | 1.6        |
|                                                                                                                        | 12.00      | 220                       | 0.345     | 5835                      | 2015                       | 228.0                       | 1.6        |
|                                                                                                                        | 12.20      | 220                       | 0.350     | 5740                      | 2010                       | 235.0                       | 1.7        |
|                                                                                                                        | 12.50      | 220                       | 0.355     | 5600                      | 1990                       | 244.0                       | 1.7        |
|                                                                                                                        | 12.80      | 220                       | 0.365     | 5470                      | 1995                       | 256.5                       | 1.7        |
|                                                                                                                        | 13.00      | 220                       | 0.370     | 5385                      | 1990                       | 264.0                       | 1.7        |
|                                                                                                                        | 13.20      | 220                       | 0.375     | 5305                      | 1990                       | 272.5                       | 1.7        |
|                                                                                                                        | 13.50      | 220                       | 0.385     | 5185                      | 1995                       | 285.5                       | 1.7        |
|                                                                                                                        | 13.80      | 220                       | 0.395     | 5075                      | 2005                       | 300.0                       | 1.7        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aluminium corroyé<br>Si < 6%                                                                                           | 11.80      | 250                       | 0.260     | 6745                      | 1755                       | 192.0                       | 1.8        |
|                                                                                                                        | 12.00      | 250                       | 0.265     | 6630                      | 1755                       | 198.5                       | 1.8        |
|                                                                                                                        | 12.20      | 250                       | 0.270     | 6525                      | 1760                       | 205.5                       | 1.9        |
|                                                                                                                        | 12.50      | 250                       | 0.280     | 6365                      | 1780                       | 218.5                       | 1.9        |
|                                                                                                                        | 12.80      | 250                       | 0.285     | 6215                      | 1770                       | 228.0                       | 1.9        |
|                                                                                                                        | 13.00      | 250                       | 0.290     | 6120                      | 1775                       | 235.5                       | 1.9        |
|                                                                                                                        | 13.20      | 250                       | 0.295     | 6030                      | 1780                       | 243.5                       | 1.9        |
|                                                                                                                        | 13.50      | 250                       | 0.300     | 5895                      | 1770                       | 253.5                       | 1.9        |
|                                                                                                                        | 13.80      | 250                       | 0.305     | 5765                      | 1760                       | 263.0                       | 1.9        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

# Forets hélicoïdaux Supradrill® U

5xd



|                    |                       |                        |                        |  |  |  |                          |  |                           |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|--|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 |  |  |  | <b>Inox</b><br>Stainless |  | <b>GG(G)</b><br>Aluminium |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|--|---------------------------|

| Exemple: N° cde <b>B62015 .1160</b><br><small>N° d'article Code-ø</small> |          |          |     |    |    |                  | NANO-U <sup>2</sup> |               |
|---------------------------------------------------------------------------|----------|----------|-----|----|----|------------------|---------------------|---------------|
|                                                                           |          |          |     |    |    |                  |                     | <b>B62015</b> |
|                                                                           |          |          |     |    |    |                  |                     | <b>B63015</b> |
| ø<br>Code                                                                 | d1<br>m7 | d2<br>h6 | l1  | l2 | l4 | L <sub>max</sub> |                     |               |
| .1160                                                                     | 11.60    | 12       | 118 | 71 | 45 | 52.4             |                     | ●             |
| .1170                                                                     | 11.70    | 12       | 118 | 71 | 45 | 52.4             |                     | ●             |
| .1180                                                                     | 11.80    | 12       | 118 | 71 | 45 | 52.3             |                     | ●             |
| .1190                                                                     | 11.90    | 12       | 118 | 71 | 45 | 52.4             |                     | ●             |
| .1200                                                                     | 12.00    | 12       | 118 | 71 | 45 | 52.3             |                     | ●             |
| .1210                                                                     | 12.10    | 14       | 124 | 77 | 45 | 56.3             |                     | ●             |
| .1220                                                                     | 12.20    | 14       | 124 | 77 | 45 | 56.2             |                     | ●             |
| .1230                                                                     | 12.30    | 14       | 124 | 77 | 45 | 56.2             |                     | ●             |
| .1240                                                                     | 12.40    | 14       | 124 | 77 | 45 | 56.1             |                     | ●             |
| .1250                                                                     | 12.50    | 14       | 124 | 77 | 45 | 56.1             |                     | ●             |
| .1260                                                                     | 12.60    | 14       | 124 | 77 | 45 | 56.0             |                     | ●             |
| .1270                                                                     | 12.70    | 14       | 124 | 77 | 45 | 55.9             |                     | ●             |
| .1280                                                                     | 12.80    | 14       | 124 | 77 | 45 | 55.8             |                     | ●             |
| .1290                                                                     | 12.90    | 14       | 124 | 77 | 45 | 55.8             |                     | ●             |
| .1300                                                                     | 13.00    | 14       | 124 | 77 | 45 | 55.7             |                     | ●             |
| .1310                                                                     | 13.10    | 14       | 124 | 77 | 45 | 55.7             |                     | ●             |
| .1320                                                                     | 13.20    | 14       | 124 | 77 | 45 | 55.6             |                     | ●             |
| .1330                                                                     | 13.30    | 14       | 124 | 77 | 45 | 55.6             |                     | ●             |
| .1340                                                                     | 13.40    | 14       | 124 | 77 | 45 | 55.4             |                     | ●             |
| .1350                                                                     | 13.50    | 14       | 124 | 77 | 45 | 55.4             |                     | ●             |
| .1360                                                                     | 13.60    | 14       | 124 | 77 | 45 | 55.3             |                     | ●             |
| .1370                                                                     | 13.70    | 14       | 124 | 77 | 45 | 55.4             |                     | ●             |
| .1380                                                                     | 13.80    | 14       | 124 | 77 | 45 | 55.3             |                     | ●             |

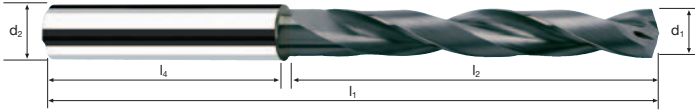
| Application                                                                       | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²       | 14.00      | 170                       | 0.370     | 3865                      | 1430                       | 220.0                       | 2.3        |
|                                                                                   |                             | 14.20      | 170                       | 0.375     | 3810                      | 1430                       | 226.5                       | 2.5        |
|                                                                                   |                             | 14.50      | 170                       | 0.380     | 3730                      | 1415                       | 233.5                       | 2.5        |
|                                                                                   |                             | 14.80      | 170                       | 0.390     | 3655                      | 1425                       | 245.0                       | 2.5        |
|                                                                                   |                             | 15.00      | 170                       | 0.395     | 3610                      | 1425                       | 252.0                       | 2.5        |
|                                                                                   |                             | 15.20      | 170                       | 0.400     | 3560                      | 1425                       | 258.5                       | 2.5        |
|                                                                                   |                             | 15.50      | 170                       | 0.410     | 3490                      | 1430                       | 270.0                       | 2.4        |
|                                                                                   |                             | 15.80      | 170                       | 0.415     | 3425                      | 1420                       | 278.5                       | 2.5        |
|                                                                                   |                             | 16.00      | 170                       | 0.420     | 3380                      | 1420                       | 285.5                       | 2.5        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm²   | 14.00      | 130                       | 0.370     | 2955                      | 1095                       | 168.5                       | 3.0        |
|                                                                                   |                             | 14.20      | 130                       | 0.375     | 2915                      | 1095                       | 173.5                       | 3.2        |
|                                                                                   |                             | 14.50      | 130                       | 0.380     | 2855                      | 1085                       | 179.0                       | 3.3        |
|                                                                                   |                             | 14.80      | 130                       | 0.390     | 2795                      | 1090                       | 187.5                       | 3.2        |
|                                                                                   |                             | 15.00      | 130                       | 0.395     | 2760                      | 1090                       | 192.5                       | 3.2        |
|                                                                                   |                             | 15.20      | 130                       | 0.400     | 2720                      | 1090                       | 198.0                       | 3.2        |
|                                                                                   |                             | 15.50      | 130                       | 0.410     | 2670                      | 1095                       | 206.5                       | 3.2        |
|                                                                                   |                             | 15.80      | 130                       | 0.415     | 2620                      | 1085                       | 212.5                       | 3.2        |
|                                                                                   |                             | 16.00      | 130                       | 0.420     | 2585                      | 1085                       | 218.0                       | 3.2        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | 14.00      | 110                       | 0.280     | 2500                      | 700                        | 108.0                       | 4.7        |
|                                                                                   |                             | 14.20      | 110                       | 0.285     | 2465                      | 705                        | 111.5                       | 5.0        |
|                                                                                   |                             | 14.50      | 110                       | 0.290     | 2415                      | 700                        | 115.5                       | 5.1        |
|                                                                                   |                             | 14.80      | 110                       | 0.295     | 2365                      | 700                        | 120.5                       | 5.0        |
|                                                                                   |                             | 15.00      | 110                       | 0.300     | 2335                      | 700                        | 123.5                       | 5.0        |
|                                                                                   |                             | 15.20      | 110                       | 0.305     | 2305                      | 705                        | 128.0                       | 5.0        |
|                                                                                   |                             | 15.50      | 110                       | 0.310     | 2260                      | 700                        | 132.0                       | 5.0        |
|                                                                                   |                             | 15.80      | 110                       | 0.315     | 2215                      | 700                        | 137.0                       | 5.0        |
|                                                                                   |                             | 16.00      | 110                       | 0.320     | 2190                      | 700                        | 140.5                       | 5.0        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm² | 14.00      | 70                        | 0.235     | 1590                      | 375                        | 57.5                        | 8.8        |
|                                                                                   |                             | 14.20      | 70                        | 0.235     | 1570                      | 370                        | 58.5                        | 9.6        |
|                                                                                   |                             | 14.50      | 70                        | 0.240     | 1535                      | 370                        | 61.0                        | 9.6        |
|                                                                                   |                             | 14.80      | 70                        | 0.245     | 1505                      | 370                        | 63.5                        | 9.5        |
|                                                                                   |                             | 15.00      | 70                        | 0.250     | 1485                      | 370                        | 65.5                        | 9.5        |
|                                                                                   |                             | 15.20      | 70                        | 0.255     | 1465                      | 375                        | 68.0                        | 9.4        |
|                                                                                   |                             | 15.50      | 70                        | 0.260     | 1440                      | 375                        | 71.0                        | 9.3        |
|                                                                                   |                             | 15.80      | 70                        | 0.265     | 1410                      | 375                        | 73.5                        | 9.3        |
|                                                                                   |                             | 16.00      | 70                        | 0.265     | 1395                      | 370                        | 74.5                        | 9.5        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 14.00      | 40                        | 0.185     | 910                       | 170                        | 26.0                        | 19.5       |
|                                                                                                                        | 14.20      | 40                        | 0.190     | 895                       | 170                        | 27.0                        | 20.9       |
|                                                                                                                        | 14.50      | 40                        | 0.195     | 880                       | 170                        | 28.0                        | 20.8       |
|                                                                                                                        | 14.80      | 40                        | 0.195     | 860                       | 170                        | 29.0                        | 20.8       |
|                                                                                                                        | 15.00      | 40                        | 0.200     | 850                       | 170                        | 30.0                        | 20.7       |
|                                                                                                                        | 15.20      | 40                        | 0.205     | 840                       | 170                        | 31.0                        | 20.7       |
|                                                                                                                        | 15.50      | 40                        | 0.205     | 820                       | 170                        | 32.0                        | 20.6       |
|                                                                                                                        | 15.80      | 40                        | 0.210     | 805                       | 170                        | 33.5                        | 20.6       |
|                                                                                                                        | 16.00      | 40                        | 0.215     | 795                       | 170                        | 34.0                        | 20.6       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 14.00      | 60                        | 0.215     | 1365                      | 295                        | 45.5                        | 11.2       |
|                                                                                                                        | 14.20      | 60                        | 0.220     | 1345                      | 295                        | 46.5                        | 12.0       |
|                                                                                                                        | 14.50      | 60                        | 0.225     | 1315                      | 295                        | 48.5                        | 12.0       |
|                                                                                                                        | 14.80      | 60                        | 0.230     | 1290                      | 295                        | 50.5                        | 12.0       |
|                                                                                                                        | 15.00      | 60                        | 0.230     | 1275                      | 295                        | 52.0                        | 11.9       |
|                                                                                                                        | 15.20      | 60                        | 0.235     | 1255                      | 295                        | 53.5                        | 11.9       |
|                                                                                                                        | 15.50      | 60                        | 0.240     | 1230                      | 295                        | 55.5                        | 11.9       |
|                                                                                                                        | 15.80      | 60                        | 0.245     | 1210                      | 295                        | 58.0                        | 11.9       |
|                                                                                                                        | 16.00      | 60                        | 0.245     | 1195                      | 295                        | 59.5                        | 11.9       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 14.00      | 220                       | 0.400     | 5000                      | 2000                       | 308.0                       | 1.7        |
|                                                                                                                        | 14.20      | 220                       | 0.405     | 4930                      | 1995                       | 316.0                       | 1.8        |
|                                                                                                                        | 14.50      | 220                       | 0.415     | 4830                      | 2005                       | 331.0                       | 1.8        |
|                                                                                                                        | 14.80      | 220                       | 0.425     | 4730                      | 2010                       | 346.0                       | 1.8        |
|                                                                                                                        | 15.00      | 220                       | 0.430     | 4670                      | 2010                       | 355.0                       | 1.8        |
|                                                                                                                        | 15.20      | 220                       | 0.435     | 4605                      | 2005                       | 364.0                       | 1.8        |
|                                                                                                                        | 15.50      | 220                       | 0.445     | 4520                      | 2010                       | 379.5                       | 1.7        |
|                                                                                                                        | 15.80      | 220                       | 0.450     | 4430                      | 1995                       | 391.0                       | 1.8        |
|                                                                                                                        | 16.00      | 220                       | 0.455     | 4375                      | 1990                       | 400.0                       | 1.8        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aluminium corroyé<br>Si < 6%                                                                                           | 14.00      | 250                       | 0.310     | 5685                      | 1760                       | 271.0                       | 1.9        |
|                                                                                                                        | 14.20      | 250                       | 0.315     | 5605                      | 1765                       | 279.5                       | 2.0        |
|                                                                                                                        | 14.50      | 250                       | 0.320     | 5490                      | 1755                       | 290.0                       | 2.0        |
|                                                                                                                        | 14.80      | 250                       | 0.330     | 5375                      | 1775                       | 305.5                       | 2.0        |
|                                                                                                                        | 15.00      | 250                       | 0.335     | 5305                      | 1775                       | 313.5                       | 2.0        |
|                                                                                                                        | 15.20      | 250                       | 0.340     | 5235                      | 1780                       | 323.0                       | 2.0        |
|                                                                                                                        | 15.50      | 250                       | 0.345     | 5135                      | 1770                       | 334.0                       | 2.0        |
|                                                                                                                        | 15.80      | 250                       | 0.350     | 5035                      | 1760                       | 345.0                       | 2.0        |
|                                                                                                                        | 16.00      | 250                       | 0.355     | 4975                      | 1765                       | 355.0                       | 2.0        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

# Forets hélicoïdaux Supradrill® U

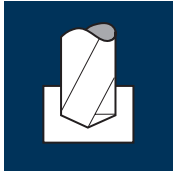
5xd

HM  
MG10



|             |                |                 |                 |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|

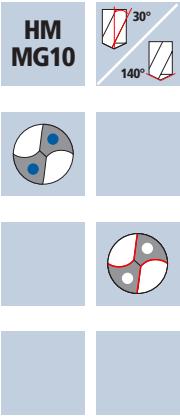
| Exemple:<br>N° cde |          |          |     |    |    |                  | NANO-U <sup>2</sup> |   |
|--------------------|----------|----------|-----|----|----|------------------|---------------------|---|
| N° d'article       |          |          |     |    |    |                  | B62015              |   |
| Code-ø             |          |          |     |    |    |                  | B63015              |   |
| ø<br>Code          | d1<br>m7 | d2<br>h6 | l1  | l2 | l4 | L <sub>max</sub> |                     |   |
| .1390              | 13.90    | 14       | 124 | 77 | 45 | 55.3             |                     | ● |
| .1400              | 14.00    | 14       | 124 | 77 | 45 | 55.3             |                     | ● |
| .1410              | 14.10    | 16       | 133 | 83 | 48 | 59.3             |                     | ● |
| .1420              | 14.20    | 16       | 133 | 83 | 48 | 59.2             |                     | ● |
| .1430              | 14.30    | 16       | 133 | 83 | 48 | 59.2             |                     | ● |
| .1440              | 14.40    | 16       | 133 | 83 | 48 | 59.1             |                     | ● |
| .1450              | 14.50    | 16       | 133 | 83 | 48 | 59.1             |                     | ● |
| .1460              | 14.60    | 16       | 133 | 83 | 48 | 58.9             |                     | ● |
| .1470              | 14.70    | 16       | 133 | 83 | 48 | 58.9             |                     | ● |
| .1480              | 14.80    | 16       | 133 | 83 | 48 | 58.8             |                     | ● |
| .1490              | 14.90    | 16       | 133 | 83 | 48 | 58.8             |                     | ● |
| .1500              | 15.00    | 16       | 133 | 83 | 48 | 58.7             |                     | ● |
| .1510              | 15.10    | 16       | 133 | 83 | 48 | 58.7             |                     | ● |
| .1520              | 15.20    | 16       | 133 | 83 | 48 | 58.6             |                     | ● |
| .1530              | 15.30    | 16       | 133 | 83 | 48 | 58.5             |                     | ● |
| .1540              | 15.40    | 16       | 133 | 83 | 48 | 58.4             |                     | ● |
| .1550              | 15.50    | 16       | 133 | 83 | 48 | 58.4             |                     | ● |
| .1560              | 15.60    | 16       | 133 | 83 | 48 | 58.3             |                     | ● |
| .1570              | 15.70    | 16       | 133 | 83 | 48 | 58.3             |                     | ● |
| .1580              | 15.80    | 16       | 133 | 83 | 48 | 58.3             |                     | ● |
| .1590              | 15.90    | 16       | 133 | 83 | 48 | 58.3             |                     | ● |
| .1600              | 16.00    | 16       | 133 | 83 | 48 | 58.3             |                     | ● |

| Application                                                                      | Matières                                | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|----------------------------------------------------------------------------------|-----------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>       | 16.20      | 170                       | 0.425     | 3340                      | 1420                       | 292.5                       | 2.8        |
|                                                                                  |                                         | 16.50      | 170                       | 0.435     | 3280                      | 1425                       | 304.5                       | 2.8        |
|                                                                                  |                                         | 16.60      | 170                       | 0.435     | 3260                      | 1420                       | 307.5                       | 2.8        |
|                                                                                  |                                         | 16.80      | 170                       | 0.440     | 3220                      | 1415                       | 313.5                       | 2.8        |
|                                                                                  |                                         | 17.00      | 170                       | 0.445     | 3185                      | 1415                       | 321.0                       | 2.8        |
|                                                                                  |                                         | 17.20      | 170                       | 0.455     | 3145                      | 1430                       | 332.5                       | 2.7        |
|                                                                                  |                                         | 17.50      | 170                       | 0.460     | 3090                      | 1420                       | 341.5                       | 2.8        |
|                                                                                  |                                         | 17.80      | 170                       | 0.470     | 3040                      | 1430                       | 356.0                       | 2.7        |
|                                                                                  |                                         | 18.00      | 170                       | 0.475     | 3005                      | 1425                       | 362.5                       | 2.7        |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup>   | 16.20      | 130                       | 0.425     | 2555                      | 1085                       | 223.5                       | 3.7        |
|                                                                                  |                                         | 16.50      | 130                       | 0.435     | 2510                      | 1090                       | 233.0                       | 3.6        |
|                                                                                  |                                         | 16.60      | 130                       | 0.435     | 2495                      | 1085                       | 235.0                       | 3.6        |
|                                                                                  |                                         | 16.80      | 130                       | 0.440     | 2465                      | 1085                       | 240.5                       | 3.6        |
|                                                                                  |                                         | 17.00      | 130                       | 0.445     | 2435                      | 1085                       | 246.5                       | 3.6        |
|                                                                                  |                                         | 17.20      | 130                       | 0.455     | 2405                      | 1095                       | 254.5                       | 3.6        |
|                                                                                  |                                         | 17.50      | 130                       | 0.460     | 2365                      | 1090                       | 262.0                       | 3.6        |
|                                                                                  |                                         | 17.80      | 130                       | 0.470     | 2325                      | 1095                       | 272.5                       | 3.6        |
|                                                                                  |                                         | 18.00      | 130                       | 0.475     | 2300                      | 1095                       | 278.5                       | 3.6        |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | 16.20      | 110                       | 0.325     | 2160                      | 700                        | 144.5                       | 5.7        |
|                                                                                  |                                         | 16.50      | 110                       | 0.330     | 2120                      | 700                        | 149.5                       | 5.7        |
|                                                                                  |                                         | 16.60      | 110                       | 0.330     | 2110                      | 695                        | 150.5                       | 5.7        |
|                                                                                  |                                         | 16.80      | 110                       | 0.335     | 2085                      | 700                        | 155.0                       | 5.6        |
|                                                                                  |                                         | 17.00      | 110                       | 0.340     | 2060                      | 700                        | 159.0                       | 5.6        |
|                                                                                  |                                         | 17.20      | 110                       | 0.345     | 2035                      | 700                        | 162.5                       | 5.6        |
|                                                                                  |                                         | 17.50      | 110                       | 0.350     | 2000                      | 700                        | 168.5                       | 5.6        |
|                                                                                  |                                         | 17.80      | 110                       | 0.355     | 1965                      | 700                        | 174.0                       | 5.6        |
|                                                                                  |                                         | 18.00      | 110                       | 0.360     | 1945                      | 700                        | 178.0                       | 5.6        |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>1100 - 1300 N/mm <sup>2</sup> | 16.20      | 70                        | 0.270     | 1375                      | 370                        | 76.5                        | 10.7       |
|                                                                                  |                                         | 16.50      | 70                        | 0.275     | 1350                      | 370                        | 79.0                        | 10.7       |
|                                                                                  |                                         | 16.60      | 70                        | 0.275     | 1340                      | 370                        | 80.0                        | 10.7       |
|                                                                                  |                                         | 16.80      | 70                        | 0.280     | 1325                      | 370                        | 82.0                        | 10.7       |
|                                                                                  |                                         | 17.00      | 70                        | 0.285     | 1310                      | 375                        | 85.0                        | 10.5       |
|                                                                                  |                                         | 17.20      | 70                        | 0.285     | 1295                      | 370                        | 86.0                        | 10.6       |
|                                                                                  |                                         | 17.50      | 70                        | 0.290     | 1275                      | 370                        | 89.0                        | 10.6       |
|                                                                                  |                                         | 17.80      | 70                        | 0.295     | 1250                      | 370                        | 92.0                        | 10.6       |
|                                                                                  |                                         | 18.00      | 70                        | 0.300     | 1240                      | 370                        | 94.0                        | 10.6       |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm <sup>2</sup>                                                                                | 16.20      | 40                        | 0.215     | 785                       | 170                        | 35.0                        | 23.4       |
|                                                                                                                        | 16.50      | 40                        | 0.220     | 770                       | 170                        | 36.5                        | 23.3       |
|                                                                                                                        | 16.60      | 40                        | 0.220     | 765                       | 170                        | 37.0                        | 23.3       |
|                                                                                                                        | 16.80      | 40                        | 0.225     | 760                       | 170                        | 37.5                        | 23.2       |
|                                                                                                                        | 17.00      | 40                        | 0.225     | 750                       | 170                        | 38.5                        | 23.2       |
|                                                                                                                        | 17.20      | 40                        | 0.230     | 740                       | 170                        | 39.5                        | 23.1       |
|                                                                                                                        | 17.50      | 40                        | 0.235     | 730                       | 170                        | 41.0                        | 23.1       |
|                                                                                                                        | 17.80      | 40                        | 0.235     | 715                       | 170                        | 42.5                        | 23.0       |
|                                                                                                                        | 18.00      | 40                        | 0.240     | 705                       | 170                        | 43.5                        | 23.0       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 16.20      | 60                        | 0.250     | 1180                      | 295                        | 61.0                        | 13.5       |
|                                                                                                                        | 16.50      | 60                        | 0.255     | 1155                      | 295                        | 63.0                        | 13.4       |
|                                                                                                                        | 16.60      | 60                        | 0.255     | 1150                      | 295                        | 64.0                        | 13.4       |
|                                                                                                                        | 16.80      | 60                        | 0.260     | 1135                      | 295                        | 65.5                        | 13.4       |
|                                                                                                                        | 17.00      | 60                        | 0.260     | 1125                      | 295                        | 67.0                        | 13.4       |
|                                                                                                                        | 17.20      | 60                        | 0.265     | 1110                      | 295                        | 68.5                        | 13.3       |
|                                                                                                                        | 17.50      | 60                        | 0.270     | 1090                      | 295                        | 71.0                        | 13.3       |
|                                                                                                                        | 17.80      | 60                        | 0.275     | 1075                      | 295                        | 73.5                        | 13.3       |
|                                                                                                                        | 18.00      | 60                        | 0.275     | 1060                      | 290                        | 74.0                        | 13.5       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 16.20      | 220                       | 0.465     | 4325                      | 2010                       | 414.5                       | 2.0        |
|                                                                                                                        | 16.50      | 220                       | 0.470     | 4245                      | 1995                       | 426.5                       | 2.0        |
|                                                                                                                        | 16.60      | 220                       | 0.475     | 4220                      | 2005                       | 434.0                       | 2.0        |
|                                                                                                                        | 16.80      | 220                       | 0.480     | 4170                      | 2000                       | 443.5                       | 2.0        |
|                                                                                                                        | 17.00      | 220                       | 0.485     | 4120                      | 2000                       | 454.0                       | 2.0        |
|                                                                                                                        | 17.20      | 220                       | 0.490     | 4070                      | 1995                       | 463.5                       | 2.0        |
|                                                                                                                        | 17.50      | 220                       | 0.500     | 4000                      | 2000                       | 481.0                       | 2.0        |
|                                                                                                                        | 17.80      | 220                       | 0.510     | 3935                      | 2005                       | 499.0                       | 2.0        |
|                                                                                                                        | 18.00      | 220                       | 0.515     | 3890                      | 2005                       | 510.0                       | 2.0        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aluminium corroyé<br>Si < 6%                                                                                           | 16.20      | 250                       | 0.360     | 4910                      | 1770                       | 365.0                       | 2.2        |
|                                                                                                                        | 16.50      | 250                       | 0.365     | 4825                      | 1760                       | 376.5                       | 2.2        |
|                                                                                                                        | 16.60      | 250                       | 0.370     | 4795                      | 1775                       | 384.0                       | 2.2        |
|                                                                                                                        | 16.80      | 250                       | 0.375     | 4735                      | 1775                       | 393.5                       | 2.2        |
|                                                                                                                        | 17.00      | 250                       | 0.380     | 4680                      | 1780                       | 404.0                       | 2.2        |
|                                                                                                                        | 17.20      | 250                       | 0.380     | 4625                      | 1760                       | 409.0                       | 2.2        |
|                                                                                                                        | 17.50      | 250                       | 0.390     | 4545                      | 1775                       | 427.0                       | 2.2        |
|                                                                                                                        | 17.80      | 250                       | 0.395     | 4470                      | 1765                       | 439.0                       | 2.2        |
|                                                                                                                        | 18.00      | 250                       | 0.400     | 4420                      | 1770                       | 450.5                       | 2.2        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

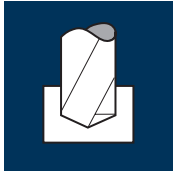
# Forets hélicoïdaux Supradrill® U

5xd



|             |                |                 |                 |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|

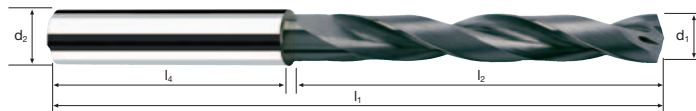
| Exemple: N° cde     |          |          |     |    |    |                  | NANO-U <sup>2</sup> |   |
|---------------------|----------|----------|-----|----|----|------------------|---------------------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | B62015              |   |
| B62015 .1610        |          |          |     |    |    |                  | B63015              |   |
| ø<br>Code           | d1<br>m7 | d2<br>h6 | l1  | l2 | l4 | L <sub>max</sub> |                     |   |
| .1610               | 16.10    | 18       | 143 | 93 | 48 | 66.3             |                     | ● |
| .1620               | 16.20    | 18       | 143 | 93 | 48 | 66.2             |                     | ● |
| .1630               | 16.30    | 18       | 143 | 93 | 48 | 66.2             |                     | ● |
| .1640               | 16.40    | 18       | 143 | 93 | 48 | 66.1             |                     | ● |
| .1650               | 16.50    | 18       | 143 | 93 | 48 | 66.0             |                     | ● |
| .1660               | 16.60    | 18       | 143 | 93 | 48 | 65.9             |                     | ● |
| .1670               | 16.70    | 18       | 143 | 93 | 48 | 65.9             |                     | ● |
| .1680               | 16.80    | 18       | 143 | 93 | 48 | 65.8             |                     | ● |
| .1690               | 16.90    | 18       | 143 | 93 | 48 | 65.8             |                     | ● |
| .1700               | 17.00    | 18       | 143 | 93 | 48 | 65.7             |                     | ● |
| .1710               | 17.10    | 18       | 143 | 93 | 48 | 65.7             |                     | ● |
| .1720               | 17.20    | 18       | 143 | 93 | 48 | 65.5             |                     | ● |
| .1730               | 17.30    | 18       | 143 | 93 | 48 | 65.5             |                     | ● |
| .1740               | 17.40    | 18       | 143 | 93 | 48 | 65.4             |                     | ● |
| .1750               | 17.50    | 18       | 143 | 93 | 48 | 65.4             |                     | ● |
| .1760               | 17.60    | 18       | 143 | 93 | 48 | 65.3             |                     | ● |
| .1770               | 17.70    | 18       | 143 | 93 | 48 | 65.3             |                     | ● |
| .1780               | 17.80    | 18       | 143 | 93 | 48 | 65.2             |                     | ● |
| .1790               | 17.90    | 18       | 143 | 93 | 48 | 65.3             |                     | ● |
| .1800               | 18.00    | 18       | 143 | 93 | 48 | 65.3             |                     | ● |
|                     |          |          |     |    |    |                  |                     |   |
|                     |          |          |     |    |    |                  |                     |   |
|                     |          |          |     |    |    |                  |                     |   |

| Application                                                                      | Matières                                | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|----------------------------------------------------------------------------------|-----------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>       | 18.50      | 170                       | 0.485     | 2925                      | 1420                       | 381.5                       | 3.0        |
|                                                                                  |                                         | 18.70      | 170                       | 0.490     | 2895                      | 1420                       | 390.0                       | 3.0        |
|                                                                                  |                                         | 19.00      | 170                       | 0.500     | 2850                      | 1425                       | 404.0                       | 3.0        |
|                                                                                  |                                         | 19.20      | 170                       | 0.505     | 2820                      | 1425                       | 412.5                       | 3.0        |
|                                                                                  |                                         | 19.30      | 170                       | 0.510     | 2805                      | 1430                       | 418.5                       | 3.0        |
|                                                                                  |                                         | 19.50      | 170                       | 0.515     | 2775                      | 1430                       | 427.0                       | 3.0        |
|                                                                                  |                                         | 19.70      | 170                       | 0.520     | 2745                      | 1425                       | 434.5                       | 3.0        |
|                                                                                  |                                         | 19.80      | 170                       | 0.520     | 2735                      | 1420                       | 437.0                       | 3.0        |
|                                                                                  |                                         | 20.00      | 170                       | 0.525     | 2705                      | 1420                       | 446.0                       | 3.0        |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup>   | 18.50      | 130                       | 0.485     | 2235                      | 1085                       | 291.5                       | 3.9        |
|                                                                                  |                                         | 18.70      | 130                       | 0.490     | 2215                      | 1085                       | 298.0                       | 3.9        |
|                                                                                  |                                         | 19.00      | 130                       | 0.500     | 2180                      | 1090                       | 309.0                       | 3.9        |
|                                                                                  |                                         | 19.20      | 130                       | 0.505     | 2155                      | 1090                       | 315.5                       | 3.9        |
|                                                                                  |                                         | 19.30      | 130                       | 0.510     | 2145                      | 1095                       | 320.5                       | 3.9        |
|                                                                                  |                                         | 19.50      | 130                       | 0.515     | 2120                      | 1090                       | 325.5                       | 3.9        |
|                                                                                  |                                         | 19.70      | 130                       | 0.520     | 2100                      | 1090                       | 332.0                       | 3.9        |
|                                                                                  |                                         | 19.80      | 130                       | 0.520     | 2090                      | 1085                       | 334.0                       | 3.9        |
|                                                                                  |                                         | 20.00      | 130                       | 0.525     | 2070                      | 1085                       | 341.0                       | 3.9        |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | 18.50      | 110                       | 0.370     | 1895                      | 700                        | 188.0                       | 6.1        |
|                                                                                  |                                         | 18.70      | 110                       | 0.375     | 1870                      | 700                        | 192.5                       | 6.1        |
|                                                                                  |                                         | 19.00      | 110                       | 0.380     | 1845                      | 700                        | 198.5                       | 6.1        |
|                                                                                  |                                         | 19.20      | 110                       | 0.385     | 1825                      | 705                        | 204.0                       | 6.0        |
|                                                                                  |                                         | 19.30      | 110                       | 0.385     | 1815                      | 700                        | 205.0                       | 6.0        |
|                                                                                  |                                         | 19.50      | 110                       | 0.390     | 1795                      | 700                        | 209.0                       | 6.0        |
|                                                                                  |                                         | 19.70      | 110                       | 0.395     | 1775                      | 700                        | 213.5                       | 6.0        |
|                                                                                  |                                         | 19.80      | 110                       | 0.395     | 1770                      | 700                        | 215.5                       | 6.0        |
|                                                                                  |                                         | 20.00      | 110                       | 0.400     | 1750                      | 700                        | 220.0                       | 6.0        |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>1100 - 1300 N/mm <sup>2</sup> | 18.50      | 70                        | 0.310     | 1205                      | 375                        | 101.0                       | 11.4       |
|                                                                                  |                                         | 18.70      | 70                        | 0.310     | 1190                      | 370                        | 101.5                       | 11.5       |
|                                                                                  |                                         | 19.00      | 70                        | 0.315     | 1175                      | 370                        | 105.0                       | 11.5       |
|                                                                                  |                                         | 19.20      | 70                        | 0.320     | 1160                      | 370                        | 107.0                       | 11.4       |
|                                                                                  |                                         | 19.30      | 70                        | 0.320     | 1155                      | 370                        | 108.0                       | 11.4       |
|                                                                                  |                                         | 19.50      | 70                        | 0.325     | 1145                      | 370                        | 110.5                       | 11.4       |
|                                                                                  |                                         | 19.70      | 70                        | 0.330     | 1130                      | 375                        | 114.5                       | 11.2       |
|                                                                                  |                                         | 19.80      | 70                        | 0.330     | 1125                      | 370                        | 114.0                       | 11.4       |
|                                                                                  |                                         | 20.00      | 70                        | 0.335     | 1115                      | 375                        | 118.0                       | 11.2       |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm <sup>2</sup>                                                                                | 18.50      | 40                        | 0.245     | 690                       | 170                        | 45.5                        | 25.0       |
|                                                                                                                        | 18.70      | 40                        | 0.250     | 680                       | 170                        | 46.5                        | 25.0       |
|                                                                                                                        | 19.00      | 40                        | 0.255     | 670                       | 170                        | 48.0                        | 25.0       |
|                                                                                                                        | 19.20      | 40                        | 0.255     | 665                       | 170                        | 49.0                        | 24.9       |
|                                                                                                                        | 19.30      | 40                        | 0.255     | 660                       | 170                        | 49.5                        | 24.9       |
|                                                                                                                        | 19.50      | 40                        | 0.260     | 655                       | 170                        | 51.0                        | 24.8       |
|                                                                                                                        | 19.70      | 40                        | 0.265     | 645                       | 170                        | 52.0                        | 24.8       |
|                                                                                                                        | 19.80      | 40                        | 0.265     | 645                       | 170                        | 52.5                        | 24.8       |
|                                                                                                                        | 20.00      | 40                        | 0.265     | 635                       | 170                        | 53.5                        | 24.8       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 18.50      | 60                        | 0.285     | 1030                      | 295                        | 79.5                        | 14.4       |
|                                                                                                                        | 18.70      | 60                        | 0.290     | 1020                      | 295                        | 81.0                        | 14.4       |
|                                                                                                                        | 19.00      | 60                        | 0.290     | 1005                      | 290                        | 82.0                        | 14.6       |
|                                                                                                                        | 19.20      | 60                        | 0.295     | 995                       | 295                        | 85.5                        | 14.3       |
|                                                                                                                        | 19.30      | 60                        | 0.295     | 990                       | 290                        | 85.0                        | 14.6       |
|                                                                                                                        | 19.50      | 60                        | 0.300     | 980                       | 295                        | 88.0                        | 14.3       |
|                                                                                                                        | 19.70      | 60                        | 0.305     | 970                       | 295                        | 90.0                        | 14.3       |
|                                                                                                                        | 19.80      | 60                        | 0.305     | 965                       | 295                        | 91.0                        | 14.3       |
|                                                                                                                        | 20.00      | 60                        | 0.310     | 955                       | 295                        | 92.5                        | 14.3       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 18.50      | 220                       | 0.530     | 3785                      | 2005                       | 539.0                       | 2.1        |
|                                                                                                                        | 18.70      | 220                       | 0.535     | 3745                      | 2005                       | 550.5                       | 2.1        |
|                                                                                                                        | 19.00      | 220                       | 0.545     | 3685                      | 2010                       | 570.0                       | 2.1        |
|                                                                                                                        | 19.20      | 220                       | 0.550     | 3645                      | 2005                       | 580.5                       | 2.1        |
|                                                                                                                        | 19.30      | 220                       | 0.550     | 3630                      | 1995                       | 583.5                       | 2.1        |
|                                                                                                                        | 19.50      | 220                       | 0.555     | 3590                      | 1990                       | 594.5                       | 2.1        |
|                                                                                                                        | 19.70      | 220                       | 0.565     | 3555                      | 2010                       | 612.5                       | 2.1        |
|                                                                                                                        | 19.80      | 220                       | 0.565     | 3535                      | 1995                       | 614.5                       | 2.1        |
|                                                                                                                        | 20.00      | 220                       | 0.570     | 3500                      | 1995                       | 626.5                       | 2.1        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aluminium corroyé<br>Si < 6%                                                                                           | 18.50      | 250                       | 0.410     | 4300                      | 1765                       | 474.5                       | 2.4        |
|                                                                                                                        | 18.70      | 250                       | 0.415     | 4255                      | 1765                       | 484.5                       | 2.4        |
|                                                                                                                        | 19.00      | 250                       | 0.420     | 4190                      | 1760                       | 499.0                       | 2.4        |
|                                                                                                                        | 19.20      | 250                       | 0.425     | 4145                      | 1760                       | 509.5                       | 2.4        |
|                                                                                                                        | 19.30      | 250                       | 0.430     | 4125                      | 1775                       | 519.5                       | 2.4        |
|                                                                                                                        | 19.50      | 250                       | 0.435     | 4080                      | 1775                       | 530.0                       | 2.4        |
|                                                                                                                        | 19.70      | 250                       | 0.440     | 4040                      | 1780                       | 542.5                       | 2.4        |
|                                                                                                                        | 19.80      | 250                       | 0.440     | 4020                      | 1770                       | 545.0                       | 2.4        |
|                                                                                                                        | 20.00      | 250                       | 0.445     | 3980                      | 1770                       | 556.0                       | 2.4        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |



## 5xd



|                    |                       |                        |                        |  |  |  |                          |  |                           |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|--|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 |  |  |  | <b>Inox</b><br>Stainless |  | <b>GG(G)</b><br>Aluminium |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|--|---------------------------|

[illegible]

## Application



## Matières

Aciers  
< 500 N/mm<sup>2</sup>

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 2.50       | 140                       | 0.060     | 17825                     | 1070                       | 5.5                         | 1.2        |
| 2.70       | 140                       | 0.065     | 16505                     | 1075                       | 6.0                         | 1.1        |
| 2.90       | 140                       | 0.070     | 15365                     | 1075                       | 7.0                         | 1.1        |
| 3.00       | 140                       | 0.070     | 14855                     | 1040                       | 7.5                         | 1.2        |
| 3.30       | 140                       | 0.080     | 13505                     | 1080                       | 9.0                         | 1.1        |
| 3.50       | 140                       | 0.085     | 12730                     | 1080                       | 10.5                        | 1.1        |
| 3.80       | 140                       | 0.090     | 11725                     | 1055                       | 12.0                        | 1.6        |
| 4.00       | 140                       | 0.095     | 11140                     | 1060                       | 13.5                        | 1.5        |
| 4.20       | 140                       | 0.100     | 10610                     | 1060                       | 14.5                        | 1.5        |

Aciers  
500 - 850 N/mm<sup>2</sup>

|      |     |       |       |     |      |     |
|------|-----|-------|-------|-----|------|-----|
| 2.50 | 110 | 0.060 | 14005 | 840 | 4.0  | 1.5 |
| 2.70 | 110 | 0.065 | 12970 | 845 | 5.0  | 1.5 |
| 2.90 | 110 | 0.070 | 12075 | 845 | 5.5  | 1.4 |
| 3.00 | 110 | 0.070 | 11670 | 815 | 6.0  | 1.5 |
| 3.30 | 110 | 0.080 | 10610 | 850 | 7.5  | 1.4 |
| 3.50 | 110 | 0.085 | 10005 | 850 | 8.0  | 1.4 |
| 3.80 | 110 | 0.090 | 9215  | 830 | 9.5  | 2.0 |
| 4.00 | 110 | 0.095 | 8755  | 830 | 10.5 | 1.9 |
| 4.20 | 110 | 0.100 | 8335  | 835 | 11.5 | 1.9 |

Aciers  
850 - 1100 N/mm<sup>2</sup>

|      |    |       |       |     |     |     |
|------|----|-------|-------|-----|-----|-----|
| 2.50 | 80 | 0.045 | 10185 | 460 | 2.5 | 2.7 |
| 2.70 | 80 | 0.050 | 9430  | 470 | 2.5 | 2.6 |
| 2.90 | 80 | 0.050 | 8780  | 440 | 3.0 | 2.8 |
| 3.00 | 80 | 0.055 | 8490  | 465 | 3.5 | 2.6 |
| 3.30 | 80 | 0.060 | 7715  | 465 | 4.0 | 2.6 |
| 3.50 | 80 | 0.065 | 7275  | 475 | 4.5 | 2.5 |
| 3.80 | 80 | 0.070 | 6700  | 470 | 5.5 | 3.5 |
| 4.00 | 80 | 0.070 | 6365  | 445 | 5.5 | 3.6 |
| 4.20 | 80 | 0.075 | 6065  | 455 | 6.5 | 3.5 |

Aciers  
1100 - 1300 N/mm<sup>2</sup>

|      |    |       |      |     |     |     |
|------|----|-------|------|-----|-----|-----|
| 2.50 | 55 | 0.040 | 7005 | 280 | 1.5 | 4.4 |
| 2.70 | 55 | 0.040 | 6485 | 260 | 1.5 | 4.7 |
| 2.90 | 55 | 0.045 | 6035 | 270 | 2.0 | 4.5 |
| 3.00 | 55 | 0.045 | 5835 | 265 | 2.0 | 4.6 |
| 3.30 | 55 | 0.050 | 5305 | 265 | 2.5 | 4.5 |
| 3.50 | 55 | 0.055 | 5000 | 275 | 2.5 | 4.3 |
| 3.80 | 55 | 0.055 | 4605 | 255 | 3.0 | 6.4 |
| 4.00 | 55 | 0.060 | 4375 | 265 | 3.5 | 6.1 |
| 4.20 | 55 | 0.065 | 4170 | 270 | 3.5 | 6.0 |

## Matières

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|      |    |       |      |    |     |      |
|------|----|-------|------|----|-----|------|
| 2.50 | 25 | 0.025 | 3185 | 80 | 0.5 | 15.6 |
| 2.70 | 25 | 0.025 | 2945 | 75 | 0.5 | 16.4 |
| 2.90 | 25 | 0.030 | 2745 | 80 | 0.5 | 15.3 |
| 3.00 | 25 | 0.030 | 2655 | 80 | 0.5 | 15.2 |
| 3.30 | 25 | 0.035 | 2410 | 85 | 0.5 | 14.1 |
| 3.50 | 25 | 0.035 | 2275 | 80 | 1.0 | 14.8 |
| 3.80 | 25 | 0.040 | 2095 | 85 | 1.0 | 19.3 |
| 4.00 | 25 | 0.040 | 1990 | 80 | 1.0 | 20.2 |
| 4.20 | 25 | 0.040 | 1895 | 75 | 1.0 | 21.4 |

Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]

|      |    |       |      |     |     |     |
|------|----|-------|------|-----|-----|-----|
| 2.50 | 50 | 0.030 | 6365 | 190 | 1.0 | 6.6 |
| 2.70 | 50 | 0.035 | 5895 | 205 | 1.0 | 6.0 |
| 2.90 | 50 | 0.035 | 5490 | 190 | 1.5 | 6.4 |
| 3.00 | 50 | 0.040 | 5305 | 210 | 1.5 | 5.8 |
| 3.30 | 50 | 0.040 | 4825 | 195 | 1.5 | 6.1 |
| 3.50 | 50 | 0.045 | 4545 | 205 | 2.0 | 5.8 |
| 3.80 | 50 | 0.050 | 4190 | 210 | 2.5 | 7.8 |
| 4.00 | 50 | 0.050 | 3980 | 200 | 2.5 | 8.1 |
| 4.20 | 50 | 0.055 | 3790 | 210 | 3.0 | 7.7 |

Fonte  
grise / sphéroïdale

|      |     |       |       |      |      |     |
|------|-----|-------|-------|------|------|-----|
| 2.50 | 160 | 0.065 | 20370 | 1325 | 6.5  | 0.9 |
| 2.70 | 160 | 0.070 | 18865 | 1320 | 7.5  | 0.9 |
| 2.90 | 160 | 0.075 | 17560 | 1315 | 8.5  | 0.9 |
| 3.00 | 160 | 0.075 | 16975 | 1275 | 9.0  | 1.0 |
| 3.30 | 160 | 0.085 | 15435 | 1310 | 11.0 | 0.9 |
| 3.50 | 160 | 0.090 | 14550 | 1310 | 12.5 | 0.9 |
| 3.80 | 160 | 0.100 | 13405 | 1340 | 15.0 | 1.2 |
| 4.00 | 160 | 0.105 | 12730 | 1335 | 17.0 | 1.2 |
| 4.20 | 160 | 0.110 | 12125 | 1335 | 18.5 | 1.2 |

Aluminium corroyé  
Si < 6%

|      |     |       |       |      |      |     |
|------|-----|-------|-------|------|------|-----|
| 2.50 | 220 | 0.050 | 28010 | 1400 | 7.0  | 0.9 |
| 2.70 | 220 | 0.055 | 25935 | 1425 | 8.0  | 0.9 |
| 2.90 | 220 | 0.060 | 24150 | 1450 | 9.5  | 0.8 |
| 3.00 | 220 | 0.060 | 23345 | 1400 | 10.0 | 0.9 |
| 3.30 | 220 | 0.065 | 21220 | 1380 | 12.0 | 0.9 |
| 3.50 | 220 | 0.070 | 20010 | 1400 | 13.5 | 0.8 |
| 3.80 | 220 | 0.075 | 18430 | 1380 | 15.5 | 1.2 |
| 4.00 | 220 | 0.080 | 17505 | 1400 | 17.5 | 1.2 |
| 4.20 | 220 | 0.085 | 16675 | 1415 | 19.5 | 1.1 |

# Forets hélicoïdaux Supradrill® U

5xd

HM  
MG10



|             |                |                 |                 |  |  |  |  |  |  |                    |
|-------------|----------------|-----------------|-----------------|--|--|--|--|--|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  |  |  |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|-----------------|--|--|--|--|--|--|--------------------|

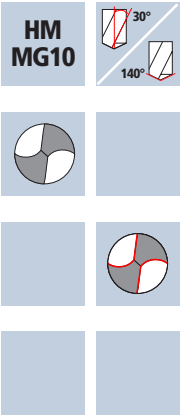
| Exemple:<br>N° cde     |          |          |    |    |    |                  | NANO-U <sup>2</sup> |   |
|------------------------|----------|----------|----|----|----|------------------|---------------------|---|
| N° d'article<br>Code-ø |          |          |    |    |    |                  | B62014              |   |
| B62014 .0250           |          |          |    |    |    |                  | B63014              |   |
| ø<br>Code              | d1<br>m7 | d2<br>h6 | l1 | l2 | l4 | L <sub>max</sub> |                     |   |
| .0250                  | 2.50     | 6        | 66 | 28 | 36 | 20.8             |                     | ● |
| .0255                  | 2.55     | 6        | 66 | 28 | 36 | 20.7             |                     | ● |
| .0260                  | 2.60     | 6        | 66 | 28 | 36 | 20.6             |                     | ● |
| .0265                  | 2.65     | 6        | 66 | 28 | 36 | 20.6             |                     | ● |
| .0270                  | 2.70     | 6        | 66 | 28 | 36 | 20.6             |                     | ● |
| .0280                  | 2.80     | 6        | 66 | 28 | 36 | 20.4             |                     | ● |
| .0285                  | 2.85     | 6        | 66 | 28 | 36 | 20.4             |                     | ● |
| .0290                  | 2.90     | 6        | 66 | 28 | 36 | 20.4             |                     | ● |
| .0295                  | 2.95     | 6        | 66 | 28 | 36 | 20.3             |                     | ● |
| .0300                  | 3.00     | 6        | 66 | 28 | 36 | 20.2             |                     | ● |
| .0310                  | 3.10     | 6        | 66 | 28 | 36 | 20.2             |                     | ● |
| .0320                  | 3.20     | 6        | 66 | 28 | 36 | 20.0             |                     | ● |
| .0330                  | 3.30     | 6        | 66 | 28 | 36 | 20.0             |                     | ● |
| .0340                  | 3.40     | 6        | 66 | 28 | 36 | 19.8             |                     | ● |
| .0350                  | 3.50     | 6        | 66 | 28 | 36 | 19.8             |                     | ● |
| .0360                  | 3.60     | 6        | 66 | 28 | 36 | 19.6             |                     | ● |
| .0370                  | 3.70     | 6        | 66 | 28 | 36 | 19.6             |                     | ● |
| .0380                  | 3.80     | 6        | 74 | 36 | 36 | 27.4             |                     | ● |
| .0390                  | 3.90     | 6        | 74 | 36 | 36 | 27.4             |                     | ● |
| .0400                  | 4.00     | 6        | 74 | 36 | 36 | 26.9             |                     | ● |
| .0410                  | 4.10     | 6        | 74 | 36 | 36 | 26.9             |                     | ● |
| .0420                  | 4.20     | 6        | 74 | 36 | 36 | 26.8             |                     | ● |
| .0430                  | 4.30     | 6        | 74 | 36 | 36 | 26.8             |                     | ● |

| Application                                                                       | Matières                                | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>       | 4.50       | 140                       | 0.105     | 9905                      | 1040                       | 16.5                        | 1.5        |
|                                                                                   |                                         | 4.80       | 140                       | 0.115     | 9285                      | 1070                       | 19.5                        | 1.9        |
|                                                                                   |                                         | 5.00       | 140                       | 0.120     | 8915                      | 1070                       | 21.0                        | 2.0        |
|                                                                                   |                                         | 5.10       | 140                       | 0.120     | 8740                      | 1050                       | 21.5                        | 2.0        |
|                                                                                   |                                         | 5.50       | 140                       | 0.130     | 8100                      | 1055                       | 25.0                        | 2.0        |
|                                                                                   |                                         | 5.80       | 140                       | 0.135     | 7685                      | 1035                       | 27.5                        | 2.0        |
|                                                                                   |                                         | 6.00       | 140                       | 0.140     | 7425                      | 1040                       | 29.5                        | 2.0        |
|                                                                                   |                                         | 6.10       | 140                       | 0.145     | 7305                      | 1060                       | 31.0                        | 2.3        |
|                                                                                   |                                         | 6.50       | 140                       | 0.155     | 6855                      | 1065                       | 35.5                        | 2.3        |
|                                                                                   |                                         | 6.50       | 140                       | 0.155     | 6855                      | 1065                       | 35.5                        | 2.3        |
|                                                                                   | Aciers<br>500 - 850 N/mm <sup>2</sup>   | 4.50       | 110                       | 0.105     | 7780                      | 815                        | 13.0                        | 2.0        |
|                                                                                   |                                         | 4.80       | 110                       | 0.115     | 7295                      | 840                        | 15.0                        | 2.5        |
|                                                                                   |                                         | 5.00       | 110                       | 0.120     | 7005                      | 840                        | 16.5                        | 2.5        |
|                                                                                   |                                         | 5.10       | 110                       | 0.120     | 6865                      | 825                        | 17.0                        | 2.5        |
|                                                                                   |                                         | 5.50       | 110                       | 0.130     | 6365                      | 825                        | 19.5                        | 2.5        |
|                                                                                   |                                         | 5.80       | 110                       | 0.135     | 6035                      | 815                        | 21.5                        | 2.5        |
|                                                                                   |                                         | 6.00       | 110                       | 0.140     | 5835                      | 815                        | 23.0                        | 2.5        |
|                                                                                   |                                         | 6.10       | 110                       | 0.145     | 5740                      | 830                        | 24.5                        | 3.0        |
|                                                                                   |                                         | 6.50       | 110                       | 0.155     | 5385                      | 835                        | 27.5                        | 2.9        |
|                                                                                   |                                         | 6.50       | 110                       | 0.155     | 5385                      | 835                        | 27.5                        | 2.9        |
|                                                                                   | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | 4.50       | 80                        | 0.080     | 5660                      | 455                        | 7.0                         | 3.5        |
|                                                                                   |                                         | 4.80       | 80                        | 0.085     | 5305                      | 450                        | 8.0                         | 4.6        |
|                                                                                   |                                         | 5.00       | 80                        | 0.090     | 5095                      | 460                        | 9.0                         | 4.5        |
|                                                                                   |                                         | 5.10       | 80                        | 0.090     | 4995                      | 450                        | 9.0                         | 4.6        |
|                                                                                   |                                         | 5.50       | 80                        | 0.100     | 4630                      | 465                        | 11.0                        | 4.4        |
|                                                                                   |                                         | 5.80       | 80                        | 0.105     | 4390                      | 460                        | 12.0                        | 4.5        |
|                                                                                   |                                         | 6.00       | 80                        | 0.110     | 4245                      | 465                        | 13.0                        | 4.5        |
|                                                                                   |                                         | 6.10       | 80                        | 0.110     | 4175                      | 460                        | 13.5                        | 5.4        |
|                                                                                   |                                         | 6.50       | 80                        | 0.115     | 3920                      | 450                        | 15.0                        | 5.5        |
|                                                                                   |                                         | 6.50       | 80                        | 0.115     | 3920                      | 450                        | 15.0                        | 5.5        |
|                                                                                   | Aciers<br>1100 - 1300 N/mm <sup>2</sup> | 4.50       | 55                        | 0.070     | 3890                      | 270                        | 4.5                         | 5.9        |
|                                                                                   |                                         | 4.80       | 55                        | 0.070     | 3645                      | 255                        | 4.5                         | 8.1        |
|                                                                                   |                                         | 5.00       | 55                        | 0.075     | 3500                      | 265                        | 5.0                         | 7.9        |
|                                                                                   |                                         | 5.10       | 55                        | 0.075     | 3435                      | 260                        | 5.5                         | 8.0        |
|                                                                                   |                                         | 5.50       | 55                        | 0.085     | 3185                      | 270                        | 6.5                         | 7.7        |
|                                                                                   |                                         | 5.80       | 55                        | 0.085     | 3020                      | 255                        | 6.5                         | 8.1        |
|                                                                                   |                                         | 6.00       | 55                        | 0.090     | 2920                      | 265                        | 7.5                         | 7.8        |
|                                                                                   |                                         | 6.10       | 55                        | 0.090     | 2870                      | 260                        | 7.5                         | 9.5        |
|                                                                                   |                                         | 6.50       | 55                        | 0.100     | 2695                      | 270                        | 9.0                         | 9.1        |
|                                                                                   |                                         | 6.50       | 55                        | 0.100     | 2695                      | 270                        | 9.0                         | 9.1        |

| Matières                                                                       | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|--------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm <sup>2</sup>                                        | 4.50       | 25                        | 0.045     | 1770                      | 80                         | 1.5                         | 19.9       |
|                                                                                | 4.80       | 25                        | 0.050     | 1660                      | 85                         | 1.5                         | 24.3       |
|                                                                                | 5.00       | 25                        | 0.050     | 1590                      | 80                         | 1.5                         | 26.1       |
|                                                                                | 5.10       | 25                        | 0.050     | 1560                      | 80                         | 1.5                         | 26.0       |
|                                                                                | 5.50       | 25                        | 0.055     | 1445                      | 80                         | 2.0                         | 25.8       |
|                                                                                | 5.80       | 25                        | 0.060     | 1370                      | 80                         | 2.0                         | 25.8       |
|                                                                                | 6.00       | 25                        | 0.060     | 1325                      | 80                         | 2.5                         | 25.9       |
|                                                                                | 6.10       | 25                        | 0.060     | 1305                      | 80                         | 2.5                         | 31.0       |
|                                                                                | 6.50       | 25                        | 0.065     | 1225                      | 80                         | 2.5                         | 30.8       |
|                                                                                | 6.50       | 25                        | 0.065     | 1225                      | 80                         | 2.5                         | 30.8       |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379] | 4.50       | 50                        | 0.060     | 3535                      | 210                        | 3.5                         | 7.6        |
|                                                                                | 4.80       | 50                        | 0.060     | 3315                      | 200                        | 3.5                         | 10.3       |
|                                                                                | 5.00       | 50                        | 0.065     | 3185                      | 205                        | 4.0                         | 10.2       |
|                                                                                | 5.10       | 50                        | 0.065     | 3120                      | 205                        | 4.0                         | 10.1       |
|                                                                                | 5.50       | 50                        | 0.070     | 2895                      | 205                        | 5.0                         | 10.1       |
|                                                                                | 5.80       | 50                        | 0.075     | 2745                      | 205                        | 5.5                         | 10.1       |
|                                                                                | 6.00       | 50                        | 0.075     | 2655                      | 200                        | 5.5                         | 10.3       |
|                                                                                | 6.10       | 50                        | 0.080     | 2610                      | 210                        | 6.0                         | 11.8       |
|                                                                                | 6.50       | 50                        | 0.085     | 2450                      | 210                        | 7.0                         | 11.7       |
|                                                                                | 6.50       | 50                        | 0.085     | 2450                      | 210                        | 7.0                         | 11.7       |
| Fonte<br>grise / sphéroïdale                                                   | 4.50       | 160                       | 0.115     | 11320                     | 1300                       | 20.5                        | 1.2        |
|                                                                                | 4.80       | 160                       | 0.125     | 10610                     | 1325                       | 24.0                        | 1.6        |
|                                                                                | 5.00       | 160                       | 0.130     | 10185                     | 1325                       | 26.0                        | 1.6        |
|                                                                                | 5.10       | 160                       | 0.130     | 9985                      | 1300                       | 26.5                        | 1.6        |
|                                                                                | 5.50       | 160                       | 0.140     | 9260                      | 1295                       | 31.0                        | 1.6        |
|                                                                                | 5.80       | 160                       | 0.150     | 8780                      | 1315                       | 34.5                        | 1.6        |
|                                                                                | 6.00       | 160                       | 0.155     | 8490                      | 1315                       | 37.0                        | 1.6        |
|                                                                                | 6.10       | 160                       | 0.155     | 8350                      | 1295                       | 38.0                        | 1.9        |
|                                                                                | 6.50       | 160                       | 0.165     | 7835                      | 1295                       | 43.0                        | 1.9        |
|                                                                                | 6.50       | 160                       | 0.165     | 7835                      | 1295                       | 43.0                        | 1.9        |
| Aluminium corroyé<br>Si < 6%                                                   | 4.50       | 220                       | 0.090     | 15560                     | 1400                       | 22.5                        | 1.1        |
|                                                                                | 4.80       | 220                       | 0.095     | 14590                     | 1385                       | 25.0                        | 1.5        |
|                                                                                | 5.00       | 220                       | 0.100     | 14005                     | 1400                       | 27.5                        | 1.5        |
|                                                                                | 5.10       | 220                       | 0.100     | 13730                     | 1375                       | 28.0                        | 1.5        |
|                                                                                | 5.50       | 220                       | 0.110     | 12730                     | 1400                       | 33.5                        | 1.5        |
|                                                                                | 5.80       | 220                       | 0.115     | 12075                     | 1390                       | 36.5                        | 1.5        |
|                                                                                | 6.00       | 220                       | 0.120     | 11670                     | 1400                       | 39.5                        | 1.5        |
|                                                                                | 6.10       | 220                       | 0.120     | 11480                     | 1380                       | 40.5                        | 1.8        |
|                                                                                | 6.50       | 220                       | 0.130     | 10775                     | 1400                       | 46.5                        | 1.8        |
|                                                                                | 6.50       | 220                       | 0.130     | 10775                     | 1400                       | 46.5                        | 1.8        |

# Forets hélicoïdaux Supradrill® U

5xd



|             |                |                 |                 |  |  |  |  |  |  |                    |
|-------------|----------------|-----------------|-----------------|--|--|--|--|--|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  |  |  |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|-----------------|--|--|--|--|--|--|--------------------|

| Exemple:<br>N° cde     |          |          |    |    |    |                  | NANO-U <sup>2</sup> |   |
|------------------------|----------|----------|----|----|----|------------------|---------------------|---|
| N° d'article<br>Code-ø |          |          |    |    |    |                  | B62014              |   |
| B62014 .0440           |          |          |    |    |    |                  | B63014              |   |
| ø<br>Code              | d1<br>m7 | d2<br>h6 | l1 | l2 | l4 | L <sub>max</sub> |                     |   |
| .0440                  | 4.40     | 6        | 74 | 36 | 36 | 26.6             |                     | ● |
| .0450                  | 4.50     | 6        | 74 | 36 | 36 | 26.6             |                     | ● |
| .0460                  | 4.60     | 6        | 74 | 36 | 36 | 26.5             |                     | ● |
| .0470                  | 4.70     | 6        | 74 | 36 | 36 | 26.5             |                     | ● |
| .0480                  | 4.80     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |
| .0490                  | 4.90     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |
| .0500                  | 5.00     | 6        | 82 | 44 | 36 | 34.8             |                     | ● |
| .0510                  | 5.10     | 6        | 82 | 44 | 36 | 34.7             |                     | ● |
| .0520                  | 5.20     | 6        | 82 | 44 | 36 | 34.6             |                     | ● |
| .0530                  | 5.30     | 6        | 82 | 44 | 36 | 34.6             |                     | ● |
| .0540                  | 5.40     | 6        | 82 | 44 | 36 | 34.5             |                     | ● |
| .0550                  | 5.50     | 6        | 82 | 44 | 36 | 34.5             |                     | ● |
| .0560                  | 5.60     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |
| .0570                  | 5.70     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |
| .0580                  | 5.80     | 6        | 82 | 44 | 36 | 34.4             |                     | ● |
| .0590                  | 5.90     | 6        | 82 | 44 | 36 | 34.5             |                     | ● |
| .0600                  | 6.00     | 6        | 82 | 44 | 36 | 34.5             |                     | ● |
| .0610                  | 6.10     | 8        | 91 | 53 | 36 | 41.4             |                     | ● |
| .0620                  | 6.20     | 8        | 91 | 53 | 36 | 41.2             |                     | ● |
| .0630                  | 6.30     | 8        | 91 | 53 | 36 | 41.2             |                     | ● |
| .0640                  | 6.40     | 8        | 91 | 53 | 36 | 41.1             |                     | ● |
| .0650                  | 6.50     | 8        | 91 | 53 | 36 | 41.1             |                     | ● |
| .0660                  | 6.60     | 8        | 91 | 53 | 36 | 41.0             |                     | ● |

## Application



## Matières

Aciers  
< 500 N/mm<sup>2</sup>

Aciers  
500 - 850 N/mm<sup>2</sup>

Aciers  
850 - 1100 N/mm<sup>2</sup>

Aciers  
1100 - 1300 N/mm<sup>2</sup>

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 6.80       | 140                       | 0.160     | 6555                      | 1050                       | 38.0                        | 2.3        |
| 6.90       | 140                       | 0.165     | 6460                      | 1065                       | 40.0                        | 2.3        |
| 7.00       | 140                       | 0.165     | 6365                      | 1050                       | 40.5                        | 2.3        |
| 7.50       | 140                       | 0.180     | 5940                      | 1070                       | 47.5                        | 2.3        |
| 7.80       | 140                       | 0.185     | 5715                      | 1055                       | 50.5                        | 2.3        |
| 8.00       | 140                       | 0.190     | 5570                      | 1060                       | 53.5                        | 2.3        |
| 8.20       | 140                       | 0.195     | 5435                      | 1060                       | 56.0                        | 2.6        |
| 8.50       | 140                       | 0.200     | 5245                      | 1050                       | 59.5                        | 2.6        |
| 8.60       | 140                       | 0.205     | 5180                      | 1060                       | 61.5                        | 2.6        |
| 6.80       | 110                       | 0.160     | 5150                      | 825                        | 30.0                        | 3.0        |
| 6.90       | 110                       | 0.165     | 5075                      | 835                        | 31.0                        | 2.9        |
| 7.00       | 110                       | 0.165     | 5000                      | 825                        | 31.5                        | 3.0        |
| 7.50       | 110                       | 0.180     | 4670                      | 840                        | 37.0                        | 2.9        |
| 7.80       | 110                       | 0.185     | 4490                      | 830                        | 39.5                        | 2.9        |
| 8.00       | 110                       | 0.190     | 4375                      | 830                        | 41.5                        | 2.9        |
| 8.20       | 110                       | 0.195     | 4270                      | 835                        | 44.0                        | 3.3        |
| 8.50       | 110                       | 0.200     | 4120                      | 825                        | 47.0                        | 3.3        |
| 8.60       | 110                       | 0.205     | 4070                      | 835                        | 48.5                        | 3.3        |
| 6.80       | 80                        | 0.120     | 3745                      | 450                        | 16.5                        | 5.5        |
| 6.90       | 80                        | 0.125     | 3690                      | 460                        | 17.0                        | 5.3        |
| 7.00       | 80                        | 0.125     | 3640                      | 455                        | 17.5                        | 5.4        |
| 7.50       | 80                        | 0.135     | 3395                      | 460                        | 20.5                        | 5.3        |
| 7.80       | 80                        | 0.140     | 3265                      | 455                        | 21.5                        | 5.3        |
| 8.00       | 80                        | 0.145     | 3185                      | 460                        | 23.0                        | 5.3        |
| 8.20       | 80                        | 0.150     | 3105                      | 465                        | 24.5                        | 6.0        |
| 8.50       | 80                        | 0.155     | 2995                      | 465                        | 26.5                        | 5.9        |
| 8.60       | 80                        | 0.155     | 2960                      | 460                        | 26.5                        | 6.0        |
| 6.80       | 55                        | 0.100     | 2575                      | 260                        | 9.5                         | 9.4        |
| 6.90       | 55                        | 0.105     | 2535                      | 265                        | 10.0                        | 9.2        |
| 7.00       | 55                        | 0.105     | 2500                      | 265                        | 10.0                        | 9.2        |
| 7.50       | 55                        | 0.115     | 2335                      | 270                        | 12.0                        | 9.0        |
| 7.80       | 55                        | 0.115     | 2245                      | 260                        | 12.5                        | 9.3        |
| 8.00       | 55                        | 0.120     | 2190                      | 265                        | 13.5                        | 9.1        |
| 8.20       | 55                        | 0.125     | 2135                      | 265                        | 14.0                        | 10.5       |
| 8.50       | 55                        | 0.130     | 2060                      | 270                        | 15.5                        | 10.2       |
| 8.60       | 55                        | 0.130     | 2035                      | 265                        | 15.5                        | 10.4       |

## Matières

Aciers  
1300 - 1500 N/mm<sup>2</sup>

Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]

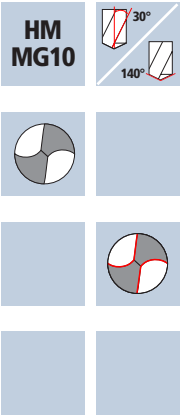
Fonte  
grise / sphéroïdale

Aluminium corroyé  
Si < 6%

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 6.80       | 25                        | 0.070     | 1170                      | 80                         | 3.0                         | 30.7       |
| 6.90       | 25                        | 0.070     | 1155                      | 80                         | 3.0                         | 30.6       |
| 7.00       | 25                        | 0.070     | 1135                      | 80                         | 3.0                         | 30.5       |
| 7.50       | 25                        | 0.075     | 1060                      | 80                         | 3.5                         | 30.3       |
| 7.80       | 25                        | 0.080     | 1020                      | 80                         | 4.0                         | 30.3       |
| 8.00       | 25                        | 0.080     | 995                       | 80                         | 4.0                         | 30.3       |
| 8.20       | 25                        | 0.080     | 970                       | 80                         | 4.0                         | 34.6       |
| 8.50       | 25                        | 0.085     | 935                       | 80                         | 4.5                         | 34.5       |
| 8.60       | 25                        | 0.085     | 925                       | 80                         | 4.5                         | 34.5       |
| 6.80       | 50                        | 0.085     | 2340                      | 200                        | 7.5                         | 12.3       |
| 6.90       | 50                        | 0.090     | 2305                      | 205                        | 7.5                         | 12.0       |
| 7.00       | 50                        | 0.090     | 2275                      | 205                        | 8.0                         | 11.9       |
| 7.50       | 50                        | 0.095     | 2120                      | 200                        | 9.0                         | 12.1       |
| 7.80       | 50                        | 0.100     | 2040                      | 205                        | 10.0                        | 11.8       |
| 8.00       | 50                        | 0.105     | 1990                      | 210                        | 10.5                        | 11.5       |
| 8.20       | 50                        | 0.105     | 1940                      | 205                        | 11.0                        | 13.5       |
| 8.50       | 50                        | 0.110     | 1870                      | 205                        | 11.5                        | 13.5       |
| 8.60       | 50                        | 0.110     | 1850                      | 205                        | 12.0                        | 13.5       |
| 6.80       | 160                       | 0.175     | 7490                      | 1310                       | 47.5                        | 1.9        |
| 6.90       | 160                       | 0.175     | 7380                      | 1290                       | 48.0                        | 1.9        |
| 7.00       | 160                       | 0.180     | 7275                      | 1310                       | 50.5                        | 1.9        |
| 7.50       | 160                       | 0.195     | 6790                      | 1325                       | 58.5                        | 1.8        |
| 7.80       | 160                       | 0.200     | 6530                      | 1305                       | 62.5                        | 1.9        |
| 8.00       | 160                       | 0.205     | 6365                      | 1305                       | 65.5                        | 1.9        |
| 8.20       | 160                       | 0.210     | 6210                      | 1305                       | 69.0                        | 2.1        |
| 8.50       | 160                       | 0.220     | 5990                      | 1320                       | 75.0                        | 2.1        |
| 8.60       | 160                       | 0.220     | 5920                      | 1300                       | 75.5                        | 2.1        |
| 6.80       | 220                       | 0.135     | 10300                     | 1390                       | 50.5                        | 1.8        |
| 6.90       | 220                       | 0.140     | 10150                     | 1420                       | 53.0                        | 1.7        |
| 7.00       | 220                       | 0.140     | 10005                     | 1400                       | 54.0                        | 1.7        |
| 7.50       | 220                       | 0.150     | 9335                      | 1400                       | 62.0                        | 1.7        |
| 7.80       | 220                       | 0.155     | 8980                      | 1390                       | 66.5                        | 1.7        |
| 8.00       | 220                       | 0.160     | 8755                      | 1400                       | 70.5                        | 1.7        |
| 8.20       | 220                       | 0.165     | 8540                      | 1410                       | 74.5                        | 2.0        |
| 8.50       | 220                       | 0.170     | 8240                      | 1400                       | 79.5                        | 2.0        |
| 8.60       | 220                       | 0.170     | 8145                      | 1385                       | 80.5                        | 2.0        |

# Forets hélicoïdaux Supradrill® U

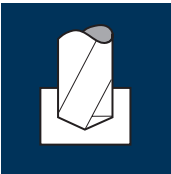
5xd



|             |                |                 |                 |  |  |  |  |  |                    |
|-------------|----------------|-----------------|-----------------|--|--|--|--|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  |  |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|-----------------|--|--|--|--|--|--------------------|

| Exemple:<br>N° cde  |          |          |     |    |    |                  | NANO-U <sup>2</sup> |   |
|---------------------|----------|----------|-----|----|----|------------------|---------------------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | B62014              |   |
| B62014 .0670        |          |          |     |    |    |                  | B63014              |   |
| ø<br>Code           | d1<br>m7 | d2<br>h6 | l1  | l2 | l4 | L <sub>max</sub> |                     |   |
| .0670               | 6.70     | 8        | 91  | 53 | 36 | 41.0             |                     | ● |
| .0680               | 6.80     | 8        | 91  | 53 | 36 | 40.9             |                     | ● |
| .0690               | 6.90     | 8        | 91  | 53 | 36 | 40.9             |                     | ● |
| .0700               | 7.00     | 8        | 91  | 53 | 36 | 40.7             |                     | ● |
| .0710               | 7.10     | 8        | 91  | 53 | 36 | 40.7             |                     | ● |
| .0720               | 7.20     | 8        | 91  | 53 | 36 | 40.6             |                     | ● |
| .0730               | 7.30     | 8        | 91  | 53 | 36 | 40.6             |                     | ● |
| .0740               | 7.40     | 8        | 91  | 53 | 36 | 40.5             |                     | ● |
| .0750               | 7.50     | 8        | 91  | 53 | 36 | 40.5             |                     | ● |
| .0760               | 7.60     | 8        | 91  | 53 | 36 | 40.4             |                     | ● |
| .0770               | 7.70     | 8        | 91  | 53 | 36 | 40.4             |                     | ● |
| .0780               | 7.80     | 8        | 91  | 53 | 36 | 40.4             |                     | ● |
| .0790               | 7.90     | 8        | 91  | 53 | 36 | 40.4             |                     | ● |
| .0800               | 8.00     | 8        | 91  | 53 | 36 | 40.4             |                     | ● |
| .0810               | 8.10     | 10       | 103 | 61 | 40 | 46.3             |                     | ● |
| .0820               | 8.20     | 10       | 103 | 61 | 40 | 46.2             |                     | ● |
| .0830               | 8.30     | 10       | 103 | 61 | 40 | 46.2             |                     | ● |
| .0840               | 8.40     | 10       | 103 | 61 | 40 | 46.1             |                     | ● |
| .0850               | 8.50     | 10       | 103 | 61 | 40 | 46.1             |                     | ● |
| .0860               | 8.60     | 10       | 103 | 61 | 40 | 46.0             |                     | ● |
| .0870               | 8.70     | 10       | 103 | 61 | 40 | 46.0             |                     | ● |
| .0880               | 8.80     | 10       | 103 | 61 | 40 | 45.9             |                     | ● |
| .0890               | 8.90     | 10       | 103 | 61 | 40 | 45.8             |                     | ● |

## Application



## Matières

**Aciers**  
**< 500 N/mm<sup>2</sup>**

Aciers  
500 - 850 N/mm<sup>2</sup>

**Aciers**  
850 - 1100 N/mm<sup>2</sup>

**Aciers**  
1100 - 1300 N/mm<sup>2</sup>

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 9.00       | 140                       | 0.215     | 4950                      | 1065                       | 68.0                        | 2.6        |
| 9.50       | 140                       | 0.225     | 4690                      | 1055                       | 75.0                        | 2.6        |
| 9.80       | 140                       | 0.230     | 4545                      | 1045                       | 79.0                        | 2.6        |
| 10.00      | 140                       | 0.235     | 4455                      | 1045                       | 82.0                        | 2.6        |
| 10.20      | 140                       | 0.240     | 4370                      | 1050                       | 86.0                        | 3.0        |
| 10.40      | 140                       | 0.245     | 4285                      | 1050                       | 89.0                        | 3.0        |
| 10.50      | 140                       | 0.250     | 4245                      | 1060                       | 92.0                        | 3.0        |
| 10.80      | 140                       | 0.255     | 4125                      | 1050                       | 96.0                        | 3.0        |
| 11.00      | 140                       | 0.260     | 4050                      | 1055                       | 100.5                       | 3.0        |
| 9.00       | 110                       | 0.215     | 3890                      | 835                        | 53.0                        | 3.3        |
| 9.50       | 110                       | 0.225     | 3685                      | 830                        | 59.0                        | 3.3        |
| 9.80       | 110                       | 0.230     | 3575                      | 820                        | 62.0                        | 3.3        |
| 10.00      | 110                       | 0.235     | 3500                      | 825                        | 65.0                        | 3.3        |
| 10.20      | 110                       | 0.240     | 3435                      | 825                        | 67.5                        | 3.9        |
| 10.40      | 110                       | 0.245     | 3365                      | 825                        | 70.0                        | 3.9        |
| 10.50      | 110                       | 0.250     | 3335                      | 835                        | 72.5                        | 3.8        |
| 10.80      | 110                       | 0.255     | 3240                      | 825                        | 75.5                        | 3.8        |
| 11.00      | 110                       | 0.260     | 3185                      | 830                        | 79.0                        | 3.8        |
| 9.00       | 80                        | 0.160     | 2830                      | 455                        | 29.0                        | 6.0        |
| 9.50       | 80                        | 0.170     | 2680                      | 455                        | 32.5                        | 6.0        |
| 9.80       | 80                        | 0.175     | 2600                      | 455                        | 34.5                        | 6.0        |
| 10.00      | 80                        | 0.180     | 2545                      | 460                        | 36.0                        | 5.9        |
| 10.20      | 80                        | 0.185     | 2495                      | 460                        | 37.5                        | 6.9        |
| 10.40      | 80                        | 0.185     | 2450                      | 455                        | 38.5                        | 7.0        |
| 10.50      | 80                        | 0.190     | 2425                      | 460                        | 40.0                        | 6.9        |
| 10.80      | 80                        | 0.195     | 2360                      | 460                        | 42.0                        | 6.9        |
| 11.00      | 80                        | 0.200     | 2315                      | 465                        | 44.0                        | 6.8        |
| 9.00       | 55                        | 0.135     | 1945                      | 265                        | 17.0                        | 10.3       |
| 9.50       | 55                        | 0.145     | 1845                      | 270                        | 19.0                        | 10.1       |
| 9.80       | 55                        | 0.145     | 1785                      | 260                        | 19.5                        | 10.5       |
| 10.00      | 55                        | 0.150     | 1750                      | 265                        | 21.0                        | 10.3       |
| 10.20      | 55                        | 0.155     | 1715                      | 265                        | 21.5                        | 12.0       |
| 10.40      | 55                        | 0.155     | 1685                      | 260                        | 22.0                        | 12.3       |
| 10.50      | 55                        | 0.160     | 1665                      | 265                        | 23.0                        | 12.0       |
| 10.80      | 55                        | 0.160     | 1620                      | 260                        | 24.0                        | 12.2       |
| 11.00      | 55                        | 0.165     | 1590                      | 260                        | 24.5                        | 12.2       |

## Matières

**Aciers**  
1300 - 1500 N/mm<sup>2</sup>

**Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]**

Fonte  
grise / sphéroïdale

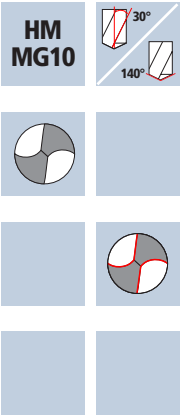
**Aluminium corroyé**  
**Si < 6%**

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 9.00       | 25                        | 0.090     | 885                       | 80                         | 5.0                         | 34.3       |
| 9.50       | 25                        | 0.095     | 840                       | 80                         | 5.5                         | 34.1       |
| 9.80       | 25                        | 0.100     | 810                       | 80                         | 6.0                         | 34.0       |
| 10.00      | 25                        | 0.100     | 795                       | 80                         | 6.5                         | 34.0       |
| 10.20      | 25                        | 0.100     | 780                       | 80                         | 6.5                         | 39.9       |
| 10.40      | 25                        | 0.105     | 765                       | 80                         | 7.0                         | 39.8       |
| 10.50      | 25                        | 0.105     | 760                       | 80                         | 7.0                         | 39.8       |
| 10.80      | 25                        | 0.110     | 735                       | 80                         | 7.5                         | 39.6       |
| 11.00      | 25                        | 0.110     | 725                       | 80                         | 7.5                         | 39.5       |
| 9.00       | 50                        | 0.115     | 1770                      | 205                        | 13.0                        | 13.4       |
| 9.50       | 50                        | 0.120     | 1675                      | 200                        | 14.0                        | 13.6       |
| 9.80       | 50                        | 0.125     | 1625                      | 205                        | 15.5                        | 13.3       |
| 10.00      | 50                        | 0.130     | 1590                      | 205                        | 16.0                        | 13.3       |
| 10.20      | 50                        | 0.130     | 1560                      | 205                        | 17.0                        | 15.6       |
| 10.40      | 50                        | 0.135     | 1530                      | 205                        | 17.5                        | 15.5       |
| 10.50      | 50                        | 0.135     | 1515                      | 205                        | 18.0                        | 15.5       |
| 10.80      | 50                        | 0.140     | 1475                      | 205                        | 19.0                        | 15.5       |
| 11.00      | 50                        | 0.140     | 1445                      | 200                        | 19.0                        | 15.8       |
| 9.00       | 160                       | 0.230     | 5660                      | 1300                       | 82.5                        | 2.1        |
| 9.50       | 160                       | 0.245     | 5360                      | 1315                       | 93.0                        | 2.1        |
| 9.80       | 160                       | 0.250     | 5195                      | 1300                       | 98.0                        | 2.1        |
| 10.00      | 160                       | 0.255     | 5095                      | 1300                       | 102.0                       | 2.1        |
| 10.20      | 160                       | 0.260     | 4995                      | 1300                       | 106.0                       | 2.5        |
| 10.40      | 160                       | 0.265     | 4895                      | 1295                       | 110.0                       | 2.5        |
| 10.50      | 160                       | 0.270     | 4850                      | 1310                       | 113.5                       | 2.4        |
| 10.80      | 160                       | 0.280     | 4715                      | 1320                       | 121.0                       | 2.4        |
| 11.00      | 160                       | 0.285     | 4630                      | 1320                       | 125.5                       | 2.4        |
| 9.00       | 220                       | 0.180     | 7780                      | 1400                       | 89.0                        | 2.0        |
| 9.50       | 220                       | 0.190     | 7370                      | 1400                       | 99.0                        | 1.9        |
| 9.80       | 220                       | 0.195     | 7145                      | 1395                       | 105.0                       | 1.9        |
| 10.00      | 220                       | 0.200     | 7005                      | 1400                       | 110.0                       | 1.9        |
| 10.20      | 220                       | 0.205     | 6865                      | 1405                       | 115.0                       | 2.3        |
| 10.40      | 220                       | 0.210     | 6735                      | 1415                       | 120.0                       | 2.3        |
| 10.50      | 220                       | 0.210     | 6670                      | 1400                       | 121.0                       | 2.3        |
| 10.80      | 220                       | 0.215     | 6485                      | 1395                       | 128.0                       | 2.3        |
| 11.00      | 220                       | 0.220     | 6365                      | 1400                       | 133.0                       | 2.3        |



# Forets hélicoïdaux Supradrill® U

5xd



|             |                |                 |                 |  |  |  |  |  |  |                    |
|-------------|----------------|-----------------|-----------------|--|--|--|--|--|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  |  |  |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|-----------------|--|--|--|--|--|--|--------------------|

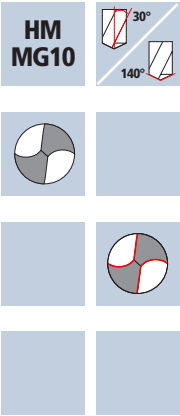
| Exemple:<br>N° cde     |          |          |     |    |    |                  | NANO-U <sup>2</sup> |   |
|------------------------|----------|----------|-----|----|----|------------------|---------------------|---|
| N° d'article<br>Code-ø |          |          |     |    |    |                  | B62014              |   |
| B62014 .0900           |          |          |     |    |    |                  | B63014              |   |
| ø<br>Code              | d1<br>m7 | d2<br>h6 | l1  | l2 | l4 | L <sub>max</sub> |                     |   |
| .0900                  | 9.00     | 10       | 103 | 61 | 40 | 45.7             |                     | ● |
| .0910                  | 9.10     | 10       | 103 | 61 | 40 | 45.7             |                     | ● |
| .0920                  | 9.20     | 10       | 103 | 61 | 40 | 45.6             |                     | ● |
| .0930                  | 9.30     | 10       | 103 | 61 | 40 | 45.6             |                     | ● |
| .0940                  | 9.40     | 10       | 103 | 61 | 40 | 45.5             |                     | ● |
| .0950                  | 9.50     | 10       | 103 | 61 | 40 | 45.5             |                     | ● |
| .0960                  | 9.60     | 10       | 103 | 61 | 40 | 45.4             |                     | ● |
| .0970                  | 9.70     | 10       | 103 | 61 | 40 | 45.4             |                     | ● |
| .0980                  | 9.80     | 10       | 103 | 61 | 40 | 45.3             |                     | ● |
| .0990                  | 9.90     | 10       | 103 | 61 | 40 | 45.4             |                     | ● |
| .1000                  | 10.00    | 10       | 103 | 61 | 40 | 45.4             |                     | ● |
| .1010                  | 10.10    | 12       | 118 | 71 | 45 | 53.3             |                     | ● |
| .1020                  | 10.20    | 12       | 118 | 71 | 45 | 53.2             |                     | ● |
| .1030                  | 10.30    | 12       | 118 | 71 | 45 | 53.2             |                     | ● |
| .1040                  | 10.40    | 12       | 118 | 71 | 45 | 53.1             |                     | ● |
| .1050                  | 10.50    | 12       | 118 | 71 | 45 | 53.1             |                     | ● |
| .1060                  | 10.60    | 12       | 118 | 71 | 45 | 53.0             |                     | ● |
| .1070                  | 10.70    | 12       | 118 | 71 | 45 | 52.9             |                     | ● |
| .1080                  | 10.80    | 12       | 118 | 71 | 45 | 52.8             |                     | ● |
| .1090                  | 10.90    | 12       | 118 | 71 | 45 | 52.8             |                     | ● |
| .1100                  | 11.00    | 12       | 118 | 71 | 45 | 52.7             |                     | ● |
| .1110                  | 11.10    | 12       | 118 | 71 | 45 | 52.7             |                     | ● |
| .1120                  | 11.20    | 12       | 118 | 71 | 45 | 52.6             |                     | ● |

| Application                                                                       | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²       | 11.50      | 140                       | 0.270     | 3875                      | 1045                       | 108.5                       | 3.0        |
|                                                                                   |                             | 11.70      | 140                       | 0.275     | 3810                      | 1050                       | 113.0                       | 3.0        |
|                                                                                   |                             | 12.00      | 140                       | 0.285     | 3715                      | 1060                       | 120.0                       | 3.0        |
|                                                                                   |                             | 12.50      | 140                       | 0.295     | 3565                      | 1050                       | 129.0                       | 3.2        |
|                                                                                   |                             | 13.00      | 140                       | 0.310     | 3430                      | 1065                       | 141.5                       | 3.1        |
|                                                                                   |                             | 14.00      | 140                       | 0.330     | 3185                      | 1050                       | 161.5                       | 3.2        |
|                                                                                   |                             | 15.00      | 140                       | 0.355     | 2970                      | 1055                       | 186.5                       | 3.3        |
|                                                                                   |                             | 15.50      | 140                       | 0.365     | 2875                      | 1050                       | 198.0                       | 3.3        |
|                                                                                   |                             | 16.00      | 140                       | 0.380     | 2785                      | 1060                       | 213.0                       | 3.3        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm²   | 11.50      | 110                       | 0.270     | 3045                      | 820                        | 85.0                        | 3.8        |
|                                                                                   |                             | 11.70      | 110                       | 0.275     | 2995                      | 825                        | 88.5                        | 3.8        |
|                                                                                   |                             | 12.00      | 110                       | 0.285     | 2920                      | 830                        | 94.0                        | 3.8        |
|                                                                                   |                             | 12.50      | 110                       | 0.295     | 2800                      | 825                        | 101.0                       | 4.1        |
|                                                                                   |                             | 13.00      | 110                       | 0.310     | 2695                      | 835                        | 111.0                       | 4.0        |
|                                                                                   |                             | 14.00      | 110                       | 0.330     | 2500                      | 825                        | 127.0                       | 4.0        |
|                                                                                   |                             | 15.00      | 110                       | 0.355     | 2335                      | 830                        | 146.5                       | 4.2        |
|                                                                                   |                             | 15.50      | 110                       | 0.365     | 2260                      | 825                        | 155.5                       | 4.2        |
|                                                                                   |                             | 16.00      | 110                       | 0.380     | 2190                      | 830                        | 167.0                       | 4.2        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | 11.50      | 80                        | 0.205     | 2215                      | 455                        | 47.5                        | 6.9        |
|                                                                                   |                             | 11.70      | 80                        | 0.210     | 2175                      | 455                        | 49.0                        | 6.9        |
|                                                                                   |                             | 12.00      | 80                        | 0.215     | 2120                      | 455                        | 51.5                        | 6.9        |
|                                                                                   |                             | 12.50      | 80                        | 0.225     | 2035                      | 460                        | 56.5                        | 7.3        |
|                                                                                   |                             | 13.00      | 80                        | 0.235     | 1960                      | 460                        | 61.0                        | 7.3        |
|                                                                                   |                             | 14.00      | 80                        | 0.250     | 1820                      | 455                        | 70.0                        | 7.3        |
|                                                                                   |                             | 15.00      | 80                        | 0.270     | 1700                      | 460                        | 81.5                        | 7.7        |
|                                                                                   |                             | 15.50      | 80                        | 0.280     | 1645                      | 460                        | 87.0                        | 7.6        |
|                                                                                   |                             | 16.00      | 80                        | 0.290     | 1590                      | 460                        | 92.5                        | 7.6        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm² | 11.50      | 55                        | 0.175     | 1520                      | 265                        | 27.5                        | 11.9       |
|                                                                                   |                             | 11.70      | 55                        | 0.175     | 1495                      | 260                        | 28.0                        | 12.1       |
|                                                                                   |                             | 12.00      | 55                        | 0.180     | 1460                      | 265                        | 30.0                        | 11.8       |
|                                                                                   |                             | 12.50      | 55                        | 0.190     | 1400                      | 265                        | 32.5                        | 12.7       |
|                                                                                   |                             | 13.00      | 55                        | 0.195     | 1345                      | 260                        | 34.5                        | 12.9       |
|                                                                                   |                             | 14.00      | 55                        | 0.210     | 1250                      | 265                        | 41.0                        | 12.5       |
|                                                                                   |                             | 15.00      | 55                        | 0.225     | 1165                      | 260                        | 46.0                        | 13.5       |
|                                                                                   |                             | 15.50      | 55                        | 0.235     | 1130                      | 265                        | 50.0                        | 13.2       |
|                                                                                   |                             | 16.00      | 55                        | 0.240     | 1095                      | 265                        | 53.5                        | 13.2       |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |

| Matières                                                                       | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|--------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm²                                                    | 11.50      | 25                        | 0.115     | 690                       | 80                         | 8.5                         | 39.3       |
|                                                                                | 11.70      | 25                        | 0.115     | 680                       | 80                         | 8.5                         | 39.3       |
|                                                                                | 12.00      | 25                        | 0.120     | 665                       | 80                         | 9.0                         | 39.2       |
|                                                                                | 12.50      | 25                        | 0.125     | 635                       | 80                         | 10.0                        | 42.0       |
|                                                                                | 13.00      | 25                        | 0.130     | 610                       | 80                         | 10.5                        | 41.8       |
|                                                                                | 14.00      | 25                        | 0.140     | 570                       | 80                         | 12.5                        | 41.5       |
|                                                                                | 15.00      | 25                        | 0.150     | 530                       | 80                         | 14.0                        | 44.0       |
|                                                                                | 15.50      | 25                        | 0.155     | 515                       | 80                         | 15.0                        | 43.8       |
|                                                                                | 16.00      | 25                        | 0.160     | 495                       | 80                         | 16.0                        | 43.7       |
|                                                                                |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379] | 11.50      | 50                        | 0.150     | 1385                      | 210                        | 22.0                        | 15.0       |
|                                                                                | 11.70      | 50                        | 0.150     | 1360                      | 205                        | 22.0                        | 15.3       |
|                                                                                | 12.00      | 50                        | 0.155     | 1325                      | 205                        | 23.0                        | 15.3       |
|                                                                                | 12.50      | 50                        | 0.160     | 1275                      | 205                        | 25.0                        | 16.4       |
|                                                                                | 13.00      | 50                        | 0.165     | 1225                      | 200                        | 26.5                        | 16.7       |
|                                                                                | 14.00      | 50                        | 0.180     | 1135                      | 205                        | 31.5                        | 16.2       |
|                                                                                | 15.00      | 50                        | 0.195     | 1060                      | 205                        | 36.0                        | 17.2       |
|                                                                                | 15.50      | 50                        | 0.200     | 1025                      | 205                        | 38.5                        | 17.1       |
|                                                                                | 16.00      | 50                        | 0.205     | 995                       | 205                        | 41.0                        | 17.1       |
|                                                                                |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                   | 11.50      | 160                       | 0.295     | 4430                      | 1305                       | 135.5                       | 2.4        |
|                                                                                | 11.70      | 160                       | 0.300     | 4355                      | 1305                       | 140.5                       | 2.4        |
|                                                                                | 12.00      | 160                       | 0.310     | 4245                      | 1315                       | 148.5                       | 2.4        |
|                                                                                | 12.50      | 160                       | 0.320     | 4075                      | 1305                       | 160.0                       | 2.6        |
|                                                                                | 13.00      | 160                       | 0.335     | 3920                      | 1315                       | 174.5                       | 2.5        |
|                                                                                | 14.00      | 160                       | 0.360     | 3640                      | 1310                       | 201.5                       | 2.5        |
|                                                                                | 15.00      | 160                       | 0.385     | 3395                      | 1305                       | 230.5                       | 2.7        |
|                                                                                | 15.50      | 160                       | 0.400     | 3285                      | 1315                       | 248.0                       | 2.7        |
|                                                                                | 16.00      | 160                       | 0.410     | 3185                      | 1305                       | 262.5                       | 2.7        |
|                                                                                |            |                           |           |                           |                            |                             |            |
| Aluminium corroyé<br>Si < 6%                                                   | 11.50      | 220                       | 0.230     | 6090                      | 1400                       | 145.5                       | 2.2        |
|                                                                                | 11.70      | 220                       | 0.235     | 5985                      | 1405                       | 151.0                       | 2.2        |
|                                                                                | 12.00      | 220                       | 0.240     | 5835                      | 1400                       | 158.5                       | 2.2        |
|                                                                                | 12.50      | 220                       | 0.250     | 5600                      | 1400                       | 172.0                       | 2.4        |
|                                                                                | 13.00      | 220                       | 0.260     | 5385                      | 1400                       | 186.0                       | 2.4        |
|                                                                                | 14.00      | 220                       | 0.280     | 5000                      | 1400                       | 215.5                       | 2.4        |
|                                                                                | 15.00      | 220                       | 0.300     | 4670                      | 1400                       | 247.5                       | 2.5        |
|                                                                                | 15.50      | 220                       | 0.310     | 4520                      | 1400                       | 264.0                       | 2.5        |
|                                                                                | 16.00      | 220                       | 0.320     | 4375                      | 1400                       | 281.5                       | 2.5        |
|                                                                                |            |                           |           |                           |                            |                             |            |

# Forets hélicoïdaux Supradrill® U

5xd



|             |                |                 |                 |  |  |  |  |  |  |                    |
|-------------|----------------|-----------------|-----------------|--|--|--|--|--|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  |  |  |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|-----------------|--|--|--|--|--|--|--------------------|

| Exemple: N° cde     |          |          |     |    |    |                  | NANO-U <sup>2</sup> |   |
|---------------------|----------|----------|-----|----|----|------------------|---------------------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | B62014              |   |
| B62014 .1130        |          |          |     |    |    |                  | B63014              |   |
| ø<br>Code           | d1<br>m7 | d2<br>h6 | l1  | l2 | l4 | L <sub>max</sub> |                     |   |
| .1130               | 11.30    | 12       | 118 | 71 | 45 | 52.6             |                     | ● |
| .1140               | 11.40    | 12       | 118 | 71 | 45 | 52.5             |                     | ● |
| .1150               | 11.50    | 12       | 118 | 71 | 45 | 52.4             |                     | ● |
| .1160               | 11.60    | 12       | 118 | 71 | 45 | 52.4             |                     | ● |
| .1170               | 11.70    | 12       | 118 | 71 | 45 | 52.4             |                     | ● |
| .1180               | 11.80    | 12       | 118 | 71 | 45 | 52.3             |                     | ● |
| .1190               | 11.90    | 12       | 118 | 71 | 45 | 52.4             |                     | ● |
| .1200               | 12.00    | 12       | 118 | 71 | 45 | 52.3             |                     | ● |
| .1250               | 12.50    | 14       | 124 | 77 | 45 | 56.1             |                     | ● |
| .1280               | 12.80    | 14       | 124 | 77 | 45 | 55.8             |                     | ● |
| .1300               | 13.00    | 14       | 124 | 77 | 45 | 55.7             |                     | ● |
| .1350               | 13.50    | 14       | 124 | 77 | 45 | 55.4             |                     | ● |
| .1380               | 13.80    | 14       | 124 | 77 | 45 | 55.3             |                     | ● |
| .1400               | 14.00    | 14       | 124 | 77 | 45 | 55.3             |                     | ● |
| .1450               | 14.50    | 16       | 133 | 83 | 48 | 59.1             |                     | ● |
| .1480               | 14.80    | 16       | 133 | 83 | 48 | 58.8             |                     | ● |
| .1500               | 15.00    | 16       | 133 | 83 | 48 | 58.7             |                     | ● |
| .1550               | 15.50    | 16       | 133 | 83 | 48 | 58.4             |                     | ● |
| .1580               | 15.80    | 16       | 133 | 83 | 48 | 58.3             |                     | ● |
| .1600               | 16.00    | 16       | 133 | 83 | 48 | 58.3             |                     | ● |
|                     |          |          |     |    |    |                  |                     |   |
|                     |          |          |     |    |    |                  |                     |   |
|                     |          |          |     |    |    |                  |                     |   |

## Application



## Matières

Aciers  
< 500 N/mm<sup>2</sup>

Aciers  
500 - 850 N/mm<sup>2</sup>

Aciers  
850 - 1100 N/mm<sup>2</sup>

Aciers  
1100 - 1300 N/mm<sup>2</sup>

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 3.00       | 180                       | 0.140     | 19100                     | 2675                       | 19.0                        | 0.4        |
| 3.30       | 180                       | 0.155     | 17360                     | 2690                       | 23.0                        | 0.4        |
| 3.50       | 180                       | 0.165     | 16370                     | 2700                       | 26.0                        | 0.4        |
| 3.80       | 180                       | 0.175     | 15080                     | 2640                       | 30.0                        | 0.4        |
| 4.00       | 180                       | 0.195     | 14325                     | 2795                       | 35.0                        | 0.4        |
| 4.20       | 180                       | 0.210     | 13640                     | 2865                       | 39.5                        | 0.4        |
| 4.50       | 180                       | 0.240     | 12730                     | 3055                       | 48.5                        | 0.4        |
| 4.80       | 180                       | 0.255     | 11935                     | 3045                       | 55.0                        | 0.4        |
| 5.00       | 180                       | 0.265     | 11460                     | 3035                       | 59.5                        | 0.4        |
| 3.00       | 160                       | 0.120     | 16975                     | 2035                       | 14.5                        | 0.5        |
| 3.30       | 160                       | 0.130     | 15435                     | 2005                       | 17.0                        | 0.5        |
| 3.50       | 160                       | 0.140     | 14550                     | 2035                       | 19.5                        | 0.5        |
| 3.80       | 160                       | 0.150     | 13405                     | 2010                       | 23.0                        | 0.6        |
| 4.00       | 160                       | 0.165     | 12730                     | 2100                       | 26.5                        | 0.5        |
| 4.20       | 160                       | 0.180     | 12125                     | 2185                       | 30.5                        | 0.5        |
| 4.50       | 160                       | 0.205     | 11320                     | 2320                       | 37.0                        | 0.5        |
| 4.80       | 160                       | 0.220     | 10610                     | 2335                       | 42.5                        | 0.5        |
| 5.00       | 160                       | 0.230     | 10185                     | 2345                       | 46.0                        | 0.5        |
| 3.00       | 140                       | 0.110     | 14855                     | 1635                       | 11.5                        | 0.6        |
| 3.30       | 140                       | 0.120     | 13505                     | 1620                       | 14.0                        | 0.6        |
| 3.50       | 140                       | 0.130     | 12730                     | 1655                       | 16.0                        | 0.6        |
| 3.80       | 140                       | 0.140     | 11725                     | 1640                       | 18.5                        | 0.7        |
| 4.00       | 140                       | 0.155     | 11140                     | 1725                       | 21.5                        | 0.7        |
| 4.20       | 140                       | 0.165     | 10610                     | 1750                       | 24.0                        | 0.6        |
| 4.50       | 140                       | 0.190     | 9905                      | 1880                       | 30.0                        | 0.6        |
| 4.80       | 140                       | 0.200     | 9285                      | 1855                       | 33.5                        | 0.6        |
| 5.00       | 140                       | 0.210     | 8915                      | 1870                       | 36.5                        | 0.6        |
| 3.00       | 100                       | 0.085     | 10610                     | 900                        | 6.5                         | 1.1        |
| 3.30       | 100                       | 0.090     | 9645                      | 870                        | 7.5                         | 1.1        |
| 3.50       | 100                       | 0.100     | 9095                      | 910                        | 9.0                         | 1.0        |
| 3.80       | 100                       | 0.105     | 8375                      | 880                        | 10.0                        | 1.3        |
| 4.00       | 100                       | 0.115     | 7960                      | 915                        | 11.5                        | 1.2        |
| 4.20       | 100                       | 0.125     | 7580                      | 950                        | 13.0                        | 1.2        |
| 4.50       | 100                       | 0.145     | 7075                      | 1025                       | 16.5                        | 1.1        |
| 4.80       | 100                       | 0.155     | 6630                      | 1030                       | 18.5                        | 1.1        |
| 5.00       | 100                       | 0.160     | 6365                      | 1020                       | 20.0                        | 1.1        |

## Matières

Aciers  
1300 - 1500 N/mm<sup>2</sup>

Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]  
Aciers inoxydables  
[Cr-Ni/1.4301]

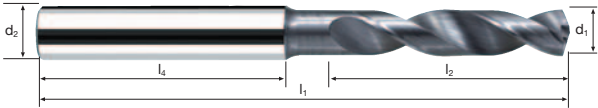
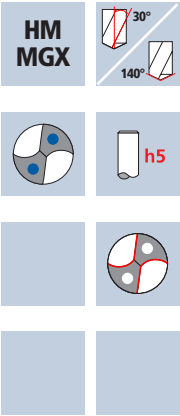
Titanes alliés trempés  
>300 HB  
[Ti6Al4V]

Fonte  
grise / sphéroïdale

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 3.00       | 55                        | 0.065     | 5835                      | 380                        | 2.5                         | 2.6        |
| 3.30       | 55                        | 0.070     | 5305                      | 370                        | 3.0                         | 2.6        |
| 3.50       | 55                        | 0.075     | 5000                      | 375                        | 3.5                         | 2.5        |
| 3.80       | 55                        | 0.080     | 4605                      | 370                        | 4.0                         | 3.1        |
| 4.00       | 55                        | 0.090     | 4375                      | 395                        | 5.0                         | 2.9        |
| 4.20       | 55                        | 0.095     | 4170                      | 395                        | 5.5                         | 2.9        |
| 4.50       | 55                        | 0.110     | 3890                      | 430                        | 7.0                         | 2.6        |
| 4.80       | 55                        | 0.120     | 3645                      | 435                        | 8.0                         | 2.5        |
| 5.00       | 55                        | 0.125     | 3500                      | 440                        | 8.5                         | 2.6        |
| 3.00       | 70                        | 0.065     | 7425                      | 485                        | 3.5                         | 2.0        |
| 3.30       | 70                        | 0.070     | 6750                      | 475                        | 4.0                         | 2.0        |
| 3.50       | 70                        | 0.075     | 6365                      | 475                        | 4.5                         | 2.0        |
| 3.80       | 70                        | 0.080     | 5865                      | 470                        | 5.5                         | 2.5        |
| 4.00       | 70                        | 0.090     | 5570                      | 500                        | 6.5                         | 2.3        |
| 4.20       | 70                        | 0.095     | 5305                      | 505                        | 7.0                         | 2.2        |
| 4.50       | 70                        | 0.110     | 4950                      | 545                        | 8.5                         | 2.0        |
| 4.80       | 70                        | 0.120     | 4640                      | 555                        | 10.0                        | 2.0        |
| 5.00       | 70                        | 0.125     | 4455                      | 555                        | 11.0                        | 2.0        |
| 3.00       | 40                        | 0.065     | 4245                      | 275                        | 2.0                         | 3.5        |
| 3.30       | 40                        | 0.070     | 3860                      | 270                        | 2.5                         | 3.5        |
| 3.50       | 40                        | 0.075     | 3640                      | 275                        | 2.5                         | 3.4        |
| 3.80       | 40                        | 0.080     | 3350                      | 270                        | 3.0                         | 4.3        |
| 4.00       | 40                        | 0.090     | 3185                      | 285                        | 3.5                         | 4.0        |
| 4.20       | 40                        | 0.095     | 3030                      | 290                        | 4.0                         | 3.9        |
| 4.50       | 40                        | 0.110     | 2830                      | 310                        | 5.0                         | 3.6        |
| 4.80       | 40                        | 0.120     | 2655                      | 320                        | 6.0                         | 3.5        |
| 5.00       | 40                        | 0.125     | 2545                      | 320                        | 6.5                         | 3.5        |
| 3.00       | 240                       | 0.125     | 25465                     | 3185                       | 22.5                        | 0.3        |
| 3.30       | 240                       | 0.140     | 23150                     | 3240                       | 27.5                        | 0.3        |
| 3.50       | 240                       | 0.150     | 21825                     | 3275                       | 31.5                        | 0.3        |
| 3.80       | 240                       | 0.160     | 20105                     | 3215                       | 36.5                        | 0.4        |
| 4.00       | 240                       | 0.175     | 19100                     | 3345                       | 42.0                        | 0.3        |
| 4.20       | 240                       | 0.190     | 18190                     | 3455                       | 48.0                        | 0.3        |
| 4.50       | 240                       | 0.220     | 16975                     | 3735                       | 59.5                        | 0.3        |
| 4.80       | 240                       | 0.235     | 15915                     | 3740                       | 67.5                        | 0.3        |
| 5.00       | 240                       | 0.240     | 15280                     | 3665                       | 72.0                        | 0.3        |

# Forets hélicoïdaux XDrill®

3xd



|             |                |                 |                 |              |  |  |                   |                |       |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|

| Exemple: N° cde     |          |          |    |    |    |                  | DURO-X |   |
|---------------------|----------|----------|----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |    |    |    |                  | B72011 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1 | l2 | l4 | L <sub>max</sub> |        |   |
| .0300               | 3.0      | 6        | 62 | 20 | 36 | 16.2             |        | ● |
| .0310               | 3.1      | 6        | 62 | 20 | 36 | 16.2             |        | ● |
| .0320               | 3.2      | 6        | 62 | 20 | 36 | 16.0             |        | ● |
| .0330               | 3.3      | 6        | 62 | 20 | 36 | 16.0             |        | ● |
| .0340               | 3.4      | 6        | 62 | 20 | 36 | 15.8             |        | ● |
| .0350               | 3.5      | 6        | 62 | 20 | 36 | 15.8             |        | ● |
| .0360               | 3.6      | 6        | 62 | 20 | 36 | 15.6             |        | ● |
| .0370               | 3.7      | 6        | 62 | 20 | 36 | 15.6             |        | ● |
| .0380               | 3.8      | 6        | 66 | 24 | 36 | 19.4             |        | ● |
| .0390               | 3.9      | 6        | 66 | 24 | 36 | 19.4             |        | ● |
| .0400               | 4.0      | 6        | 66 | 24 | 36 | 18.9             |        | ● |
| .0410               | 4.1      | 6        | 66 | 24 | 36 | 18.9             |        | ● |
| .0420               | 4.2      | 6        | 66 | 24 | 36 | 18.8             |        | ● |
| .0430               | 4.3      | 6        | 66 | 24 | 36 | 18.7             |        | ● |
| .0440               | 4.4      | 6        | 66 | 24 | 36 | 18.6             |        | ● |
| .0450               | 4.5      | 6        | 66 | 24 | 36 | 18.6             |        | ● |
| .0460               | 4.6      | 6        | 66 | 24 | 36 | 18.5             |        | ● |
| .0470               | 4.7      | 6        | 66 | 24 | 36 | 18.5             |        | ● |
| .0480               | 4.8      | 6        | 66 | 28 | 36 | 18.4             |        | ● |
| .0490               | 4.9      | 6        | 66 | 28 | 36 | 18.4             |        | ● |
| .0500               | 5.0      | 6        | 66 | 28 | 36 | 18.7             |        | ● |
| .0510               | 5.1      | 6        | 66 | 28 | 36 | 18.7             |        | ● |
| .0520               | 5.2      | 6        | 66 | 28 | 36 | 18.6             |        | ● |



| Application                       |
|-----------------------------------|
| Aciers<br>< 500 N/mm <sup>2</sup> |

|                                       |
|---------------------------------------|
| Aciers<br>500 - 850 N/mm <sup>2</sup> |
|---------------------------------------|

|                                        |
|----------------------------------------|
| Aciers<br>850 - 1100 N/mm <sup>2</sup> |
|----------------------------------------|

|                                         |
|-----------------------------------------|
| Aciers<br>1100 - 1300 N/mm <sup>2</sup> |
|-----------------------------------------|

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 5.50       | 180                       | 0.295     | 10415                     | 3070                       | 73.0                        | 0.4        |
| 5.80       | 180                       | 0.310     | 9880                      | 3065                       | 81.0                        | 0.4        |
| 6.00       | 180                       | 0.330     | 9550                      | 3150                       | 89.0                        | 0.4        |
| 6.20       | 180                       | 0.350     | 9240                      | 3235                       | 97.5                        | 0.5        |
| 6.50       | 180                       | 0.370     | 8815                      | 3260                       | 108.0                       | 0.5        |
| 6.80       | 180                       | 0.385     | 8425                      | 3245                       | 118.0                       | 0.5        |
| 7.00       | 180                       | 0.395     | 8185                      | 3235                       | 124.5                       | 0.5        |
| 7.20       | 180                       | 0.410     | 7960                      | 3265                       | 133.0                       | 0.5        |
| 7.50       | 180                       | 0.425     | 7640                      | 3245                       | 143.5                       | 0.5        |
| 5.50       | 160                       | 0.250     | 9260                      | 2315                       | 55.0                        | 0.5        |
| 5.80       | 160                       | 0.265     | 8780                      | 2325                       | 61.5                        | 0.5        |
| 6.00       | 160                       | 0.285     | 8490                      | 2420                       | 68.5                        | 0.5        |
| 6.20       | 160                       | 0.300     | 8215                      | 2465                       | 74.5                        | 0.7        |
| 6.50       | 160                       | 0.315     | 7835                      | 2470                       | 82.0                        | 0.7        |
| 6.80       | 160                       | 0.330     | 7490                      | 2470                       | 89.5                        | 0.7        |
| 7.00       | 160                       | 0.340     | 7275                      | 2475                       | 95.0                        | 0.7        |
| 7.20       | 160                       | 0.350     | 7075                      | 2475                       | 101.0                       | 0.7        |
| 7.50       | 160                       | 0.365     | 6790                      | 2480                       | 109.5                       | 0.7        |
| 5.50       | 140                       | 0.230     | 8100                      | 1865                       | 44.5                        | 0.6        |
| 5.80       | 140                       | 0.245     | 7685                      | 1885                       | 50.0                        | 0.6        |
| 6.00       | 140                       | 0.260     | 7425                      | 1930                       | 54.5                        | 0.6        |
| 6.20       | 140                       | 0.275     | 7190                      | 1975                       | 59.5                        | 0.9        |
| 6.50       | 140                       | 0.290     | 6855                      | 1990                       | 66.0                        | 0.9        |
| 6.80       | 140                       | 0.305     | 6555                      | 2000                       | 72.5                        | 0.9        |
| 7.00       | 140                       | 0.315     | 6365                      | 2005                       | 77.0                        | 0.9        |
| 7.20       | 140                       | 0.320     | 6190                      | 1980                       | 80.5                        | 0.9        |
| 7.50       | 140                       | 0.335     | 5940                      | 1990                       | 88.0                        | 0.9        |
| 5.50       | 100                       | 0.175     | 5785                      | 1010                       | 24.0                        | 1.1        |
| 5.80       | 100                       | 0.185     | 5490                      | 1015                       | 27.0                        | 1.1        |
| 6.00       | 100                       | 0.200     | 5305                      | 1060                       | 30.0                        | 1.0        |
| 6.20       | 100                       | 0.210     | 5135                      | 1080                       | 32.5                        | 1.6        |
| 6.50       | 100                       | 0.220     | 4895                      | 1075                       | 35.5                        | 1.6        |
| 6.80       | 100                       | 0.230     | 4680                      | 1075                       | 39.0                        | 1.6        |
| 7.00       | 100                       | 0.240     | 4545                      | 1090                       | 42.0                        | 1.6        |
| 7.20       | 100                       | 0.245     | 4420                      | 1085                       | 44.0                        | 1.6        |
| 7.50       | 100                       | 0.255     | 4245                      | 1080                       | 47.5                        | 1.6        |

| Matières |
|----------|
|----------|

|                                         |
|-----------------------------------------|
| Aciers<br>1300 - 1500 N/mm <sup>2</sup> |
|-----------------------------------------|

|                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------|
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] |
|------------------------------------------------------------------------------------------------------------------------|

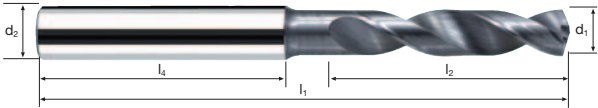
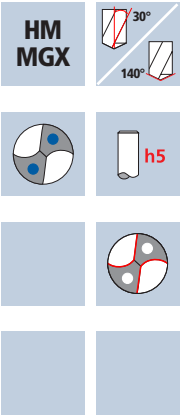
|                                                |
|------------------------------------------------|
| Titanes alliés trempés<br>>300 HB<br>[Ti6Al4V] |
|------------------------------------------------|

|                              |
|------------------------------|
| Fonte<br>grise / sphéroïdale |
|------------------------------|

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 5.50       | 55                        | 0.135     | 3185                      | 430                        | 10.0                        | 2.6        |
| 5.80       | 55                        | 0.145     | 3020                      | 440                        | 11.5                        | 2.5        |
| 6.00       | 55                        | 0.150     | 2920                      | 440                        | 12.5                        | 2.5        |
| 6.20       | 55                        | 0.160     | 2825                      | 450                        | 13.5                        | 3.9        |
| 6.50       | 55                        | 0.170     | 2695                      | 460                        | 15.5                        | 3.8        |
| 6.80       | 55                        | 0.180     | 2575                      | 465                        | 17.0                        | 3.7        |
| 7.00       | 55                        | 0.185     | 2500                      | 465                        | 18.0                        | 3.7        |
| 7.20       | 55                        | 0.190     | 2430                      | 460                        | 18.5                        | 3.7        |
| 7.50       | 55                        | 0.195     | 2335                      | 455                        | 20.0                        | 3.8        |
| 5.50       | 70                        | 0.135     | 4050                      | 545                        | 13.0                        | 2.0        |
| 5.80       | 70                        | 0.145     | 3840                      | 555                        | 14.5                        | 2.0        |
| 6.00       | 70                        | 0.150     | 3715                      | 555                        | 15.5                        | 2.0        |
| 6.20       | 70                        | 0.160     | 3595                      | 575                        | 17.5                        | 3.0        |
| 6.50       | 70                        | 0.170     | 3430                      | 585                        | 19.5                        | 3.0        |
| 6.80       | 70                        | 0.180     | 3275                      | 590                        | 21.5                        | 2.9        |
| 7.00       | 70                        | 0.185     | 3185                      | 590                        | 22.5                        | 2.9        |
| 7.20       | 70                        | 0.190     | 3095                      | 590                        | 24.0                        | 2.9        |
| 7.50       | 70                        | 0.195     | 2970                      | 580                        | 25.5                        | 2.9        |
| 5.50       | 40                        | 0.135     | 2315                      | 315                        | 7.5                         | 3.5        |
| 5.80       | 40                        | 0.145     | 2195                      | 320                        | 8.5                         | 3.5        |
| 6.00       | 40                        | 0.150     | 2120                      | 320                        | 9.0                         | 3.5        |
| 6.20       | 40                        | 0.160     | 2055                      | 330                        | 10.0                        | 5.3        |
| 6.50       | 40                        | 0.170     | 1960                      | 335                        | 11.0                        | 5.2        |
| 6.80       | 40                        | 0.180     | 1870                      | 335                        | 12.0                        | 5.2        |
| 7.00       | 40                        | 0.185     | 1820                      | 335                        | 13.0                        | 5.1        |
| 7.20       | 40                        | 0.190     | 1770                      | 335                        | 13.5                        | 5.1        |
| 7.50       | 40                        | 0.195     | 1700                      | 330                        | 14.5                        | 5.2        |
| 5.50       | 240                       | 0.265     | 13890                     | 3680                       | 87.5                        | 0.3        |
| 5.80       | 240                       | 0.280     | 13170                     | 3690                       | 97.5                        | 0.3        |
| 6.00       | 240                       | 0.300     | 12730                     | 3820                       | 108.0                       | 0.3        |
| 6.20       | 240                       | 0.320     | 12320                     | 3940                       | 119.0                       | 0.4        |
| 6.50       | 240                       | 0.335     | 11755                     | 3940                       | 130.5                       | 0.4        |
| 6.80       | 240                       | 0.350     | 11235                     | 3930                       | 142.5                       | 0.4        |
| 7.00       | 240                       | 0.360     | 10915                     | 3930                       | 151.0                       | 0.4        |
| 7.20       | 240                       | 0.370     | 10610                     | 3925                       | 160.0                       | 0.4        |
| 7.50       | 240                       | 0.385     | 10185                     | 3920                       | 173.0                       | 0.4        |

# Forets hélicoïdaux XDrill®

3xd



|             |                |                 |                 |              |  |  |                   |                |       |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|

| Exemple: N° cde     |          |          |    |    |    |                  | DURO-X |   |
|---------------------|----------|----------|----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |    |    |    |                  | B72011 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1 | l2 | l4 | L <sub>max</sub> |        |   |
| .0530               | 5.3      | 6        | 66 | 28 | 36 | 18.6             |        | ● |
| .0540               | 5.4      | 6        | 66 | 28 | 36 | 18.5             |        | ● |
| .0550               | 5.5      | 6        | 66 | 28 | 36 | 18.5             |        | ● |
| .0560               | 5.6      | 6        | 66 | 28 | 36 | 18.4             |        | ● |
| .0570               | 5.7      | 6        | 66 | 28 | 36 | 18.4             |        | ● |
| .0580               | 5.8      | 6        | 66 | 28 | 36 | 18.4             |        | ● |
| .0590               | 5.9      | 6        | 66 | 28 | 36 | 18.4             |        | ● |
| .0600               | 6.0      | 6        | 66 | 28 | 36 | 18.5             |        | ● |
| .0610               | 6.1      | 8        | 79 | 34 | 36 | 29.3             |        | ● |
| .0620               | 6.2      | 8        | 79 | 34 | 36 | 29.2             |        | ● |
| .0630               | 6.3      | 8        | 79 | 34 | 36 | 29.2             |        | ● |
| .0640               | 6.4      | 8        | 79 | 34 | 36 | 29.1             |        | ● |
| .0650               | 6.5      | 8        | 79 | 34 | 36 | 29.1             |        | ● |
| .0660               | 6.6      | 8        | 79 | 34 | 36 | 29.0             |        | ● |
| .0670               | 6.7      | 8        | 79 | 34 | 36 | 29.0             |        | ● |
| .0680               | 6.8      | 8        | 79 | 34 | 36 | 28.8             |        | ● |
| .0690               | 6.9      | 8        | 79 | 34 | 36 | 28.8             |        | ● |
| .0700               | 7.0      | 8        | 79 | 34 | 36 | 28.7             |        | ● |
| .0710               | 7.1      | 8        | 79 | 41 | 36 | 28.7             |        | ● |
| .0720               | 7.2      | 8        | 79 | 41 | 36 | 28.6             |        | ● |
| .0730               | 7.3      | 8        | 79 | 41 | 36 | 28.6             |        | ● |
| .0740               | 7.4      | 8        | 79 | 41 | 36 | 28.5             |        | ● |
| .0750               | 7.5      | 8        | 79 | 41 | 36 | 28.5             |        | ● |

## Application



## Matières

Aciers  
< 500 N/mm<sup>2</sup>

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 7.60       | 180                       | 0.430     | 7540                      | 3240                       | 147.0                       | 0.5        |
| 8.00       | 180                       | 0.455     | 7160                      | 3260                       | 164.0                       | 0.5        |
| 8.20       | 180                       | 0.465     | 6985                      | 3250                       | 171.5                       | 0.6        |
| 8.50       | 180                       | 0.480     | 6740                      | 3235                       | 183.5                       | 0.6        |
| 8.80       | 180                       | 0.500     | 6510                      | 3255                       | 198.0                       | 0.6        |
| 9.00       | 180                       | 0.510     | 6365                      | 3245                       | 206.5                       | 0.6        |
| 9.20       | 180                       | 0.520     | 6230                      | 3240                       | 215.5                       | 0.6        |
| 9.50       | 180                       | 0.540     | 6030                      | 3255                       | 230.5                       | 0.6        |
| 9.80       | 180                       | 0.555     | 5845                      | 3245                       | 245.0                       | 0.6        |

Aciers  
500 - 850 N/mm<sup>2</sup>

|      |     |       |      |      |       |     |
|------|-----|-------|------|------|-------|-----|
| 7.60 | 160 | 0.370 | 6700 | 2480 | 112.5 | 0.7 |
| 8.00 | 160 | 0.390 | 6365 | 2480 | 124.5 | 0.7 |
| 8.20 | 160 | 0.400 | 6210 | 2485 | 131.0 | 0.8 |
| 8.50 | 160 | 0.415 | 5990 | 2485 | 141.0 | 0.8 |
| 8.80 | 160 | 0.425 | 5785 | 2460 | 149.5 | 0.8 |
| 9.00 | 160 | 0.435 | 5660 | 2460 | 156.5 | 0.8 |
| 9.20 | 160 | 0.445 | 5535 | 2465 | 164.0 | 0.8 |
| 9.50 | 160 | 0.460 | 5360 | 2465 | 174.5 | 0.8 |
| 9.80 | 160 | 0.475 | 5195 | 2470 | 186.5 | 0.8 |

Aciers  
850 - 1100 N/mm<sup>2</sup>

|      |     |       |      |      |       |     |
|------|-----|-------|------|------|-------|-----|
| 7.60 | 140 | 0.340 | 5865 | 1995 | 90.5  | 0.9 |
| 8.00 | 140 | 0.360 | 5570 | 2005 | 101.0 | 0.8 |
| 8.20 | 140 | 0.365 | 5435 | 1985 | 105.0 | 1.0 |
| 8.50 | 140 | 0.380 | 5245 | 1995 | 113.0 | 1.0 |
| 8.80 | 140 | 0.395 | 5065 | 2000 | 121.5 | 1.0 |
| 9.00 | 140 | 0.405 | 4950 | 2005 | 127.5 | 0.9 |
| 9.20 | 140 | 0.410 | 4845 | 1985 | 132.0 | 1.0 |
| 9.50 | 140 | 0.425 | 4690 | 1995 | 141.5 | 0.9 |
| 9.80 | 140 | 0.440 | 4545 | 2000 | 151.0 | 0.9 |

Aciers  
1100 - 1300 N/mm<sup>2</sup>

|      |     |       |      |      |      |     |
|------|-----|-------|------|------|------|-----|
| 7.60 | 100 | 0.260 | 4190 | 1090 | 49.5 | 1.6 |
| 8.00 | 100 | 0.270 | 3980 | 1075 | 54.0 | 1.6 |
| 8.20 | 100 | 0.280 | 3880 | 1085 | 57.5 | 1.8 |
| 8.50 | 100 | 0.290 | 3745 | 1085 | 61.5 | 1.8 |
| 8.80 | 100 | 0.300 | 3615 | 1085 | 66.0 | 1.8 |
| 9.00 | 100 | 0.305 | 3535 | 1080 | 68.5 | 1.8 |
| 9.20 | 100 | 0.315 | 3460 | 1090 | 72.5 | 1.7 |
| 9.50 | 100 | 0.325 | 3350 | 1090 | 77.5 | 1.7 |
| 9.80 | 100 | 0.335 | 3250 | 1090 | 82.0 | 1.7 |

## Matières

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|      |    |       |      |     |      |     |
|------|----|-------|------|-----|------|-----|
| 7.60 | 55 | 0.200 | 2305 | 460 | 21.0 | 3.7 |
| 8.00 | 55 | 0.210 | 2190 | 460 | 23.0 | 3.7 |
| 8.20 | 55 | 0.215 | 2135 | 460 | 24.5 | 4.2 |
| 8.50 | 55 | 0.220 | 2060 | 455 | 26.0 | 4.2 |
| 8.80 | 55 | 0.230 | 1990 | 460 | 28.0 | 4.1 |
| 9.00 | 55 | 0.235 | 1945 | 455 | 29.0 | 4.2 |
| 9.20 | 55 | 0.240 | 1905 | 455 | 30.0 | 4.2 |
| 9.50 | 55 | 0.250 | 1845 | 460 | 32.5 | 4.1 |
| 9.80 | 55 | 0.255 | 1785 | 455 | 34.5 | 4.1 |

Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]  
Aciers inoxydables  
[Cr-Ni/1.4301]

|      |    |       |      |     |      |     |
|------|----|-------|------|-----|------|-----|
| 7.60 | 70 | 0.200 | 2930 | 585 | 26.5 | 2.9 |
| 8.00 | 70 | 0.210 | 2785 | 585 | 29.5 | 2.9 |
| 8.20 | 70 | 0.215 | 2715 | 585 | 31.0 | 3.3 |
| 8.50 | 70 | 0.220 | 2620 | 575 | 32.5 | 3.3 |
| 8.80 | 70 | 0.230 | 2530 | 580 | 35.5 | 3.3 |
| 9.00 | 70 | 0.235 | 2475 | 580 | 37.0 | 3.3 |
| 9.20 | 70 | 0.240 | 2420 | 580 | 38.5 | 3.3 |
| 9.50 | 70 | 0.250 | 2345 | 585 | 41.5 | 3.2 |
| 9.80 | 70 | 0.255 | 2275 | 580 | 43.5 | 3.2 |

Titanes alliés trempés  
>300 HB  
[Ti6Al4V]

|      |    |       |      |     |      |     |
|------|----|-------|------|-----|------|-----|
| 7.60 | 40 | 0.200 | 1675 | 335 | 15.0 | 5.1 |
| 8.00 | 40 | 0.210 | 1590 | 335 | 17.0 | 5.1 |
| 8.20 | 40 | 0.215 | 1555 | 335 | 17.5 | 5.8 |
| 8.50 | 40 | 0.220 | 1500 | 330 | 18.5 | 5.8 |
| 8.80 | 40 | 0.230 | 1445 | 330 | 20.0 | 5.8 |
| 9.00 | 40 | 0.235 | 1415 | 335 | 21.5 | 5.7 |
| 9.20 | 40 | 0.240 | 1385 | 330 | 22.0 | 5.7 |
| 9.50 | 40 | 0.250 | 1340 | 335 | 23.5 | 5.6 |
| 9.80 | 40 | 0.255 | 1300 | 330 | 25.0 | 5.7 |

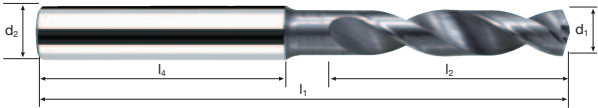
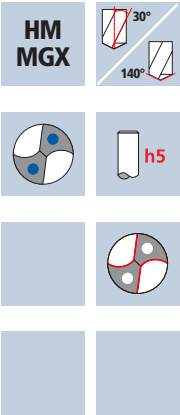
Fonte  
grise / sphéroïdale

|      |     |       |       |      |       |     |
|------|-----|-------|-------|------|-------|-----|
| 7.60 | 240 | 0.390 | 10050 | 3920 | 178.0 | 0.4 |
| 8.00 | 240 | 0.410 | 9550  | 3915 | 197.0 | 0.4 |
| 8.20 | 240 | 0.420 | 9315  | 3910 | 206.5 | 0.5 |
| 8.50 | 240 | 0.440 | 8990  | 3955 | 224.5 | 0.5 |
| 8.80 | 240 | 0.455 | 8680  | 3950 | 240.0 | 0.5 |
| 9.00 | 240 | 0.465 | 8490  | 3950 | 251.5 | 0.5 |
| 9.20 | 240 | 0.475 | 8305  | 3945 | 262.0 | 0.5 |
| 9.50 | 240 | 0.490 | 8040  | 3940 | 279.5 | 0.5 |
| 9.80 | 240 | 0.505 | 7795  | 3935 | 297.0 | 0.5 |



Forets hélicoïdaux XDrill®

3xd



|             |                |                 |                 |              |  |  |                   |                |       |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|

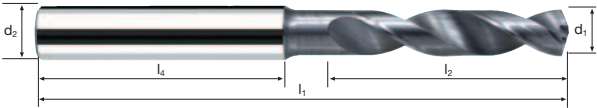
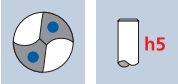
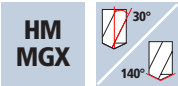
| Exemple: N° cde     |          |          |    |    |    |                  | DURO-X |   |
|---------------------|----------|----------|----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |    |    |    |                  | B72011 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1 | l2 | l4 | L <sub>max</sub> |        |   |
| .0760               | 7.6      | 8        | 79 | 41 | 36 | 28.4             |        | ● |
| .0770               | 7.7      | 8        | 79 | 41 | 36 | 28.4             |        | ● |
| .0780               | 7.8      | 8        | 79 | 41 | 36 | 28.3             |        | ● |
| .0790               | 7.9      | 8        | 79 | 41 | 36 | 28.4             |        | ● |
| .0800               | 8.0      | 8        | 79 | 41 | 36 | 28.4             |        | ● |
| .0810               | 8.1      | 10       | 89 | 47 | 40 | 32.3             |        | ● |
| .0820               | 8.2      | 10       | 89 | 47 | 40 | 32.2             |        | ● |
| .0830               | 8.3      | 10       | 89 | 47 | 40 | 32.2             |        | ● |
| .0840               | 8.4      | 10       | 89 | 47 | 40 | 32.1             |        | ● |
| .0850               | 8.5      | 10       | 89 | 47 | 40 | 32.1             |        | ● |
| .0860               | 8.6      | 10       | 89 | 47 | 40 | 31.9             |        | ● |
| .0870               | 8.7      | 10       | 89 | 47 | 40 | 31.9             |        | ● |
| .0880               | 8.8      | 10       | 89 | 47 | 40 | 31.8             |        | ● |
| .0890               | 8.9      | 10       | 89 | 47 | 40 | 31.8             |        | ● |
| .0900               | 9.0      | 10       | 89 | 47 | 40 | 31.7             |        | ● |
| .0910               | 9.1      | 10       | 89 | 47 | 40 | 31.7             |        | ● |
| .0920               | 9.2      | 10       | 89 | 47 | 40 | 31.6             |        | ● |
| .0930               | 9.3      | 10       | 89 | 47 | 40 | 31.6             |        | ● |
| .0940               | 9.4      | 10       | 89 | 47 | 40 | 31.4             |        | ● |
| .0950               | 9.5      | 10       | 89 | 47 | 40 | 31.4             |        | ● |
| .0960               | 9.6      | 10       | 89 | 47 | 40 | 31.3             |        | ● |
| .0970               | 9.7      | 10       | 89 | 47 | 40 | 31.3             |        | ● |
| .0980               | 9.8      | 10       | 89 | 47 | 40 | 31.3             |        | ● |

| Application                                                                       | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm³/min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|----------------|------------|
|  | Aciers<br>< 500 N/mm²       | 10.00      | 180                       | 0.565     | 5730                      | 3235                       | 254.0          | 0.6        |
|                                                                                   |                             | 10.20      | 180                       | 0.575     | 5615                      | 3230                       | 264.0          | 0.7        |
|                                                                                   |                             | 10.50      | 180                       | 0.590     | 5455                      | 3220                       | 279.0          | 0.7        |
|                                                                                   |                             | 10.80      | 180                       | 0.605     | 5305                      | 3210                       | 294.0          | 0.7        |
|                                                                                   |                             | 11.00      | 180                       | 0.610     | 5210                      | 3180                       | 302.0          | 0.7        |
|                                                                                   |                             | 11.20      | 180                       | 0.615     | 5115                      | 3145                       | 310.0          | 0.7        |
|                                                                                   |                             | 11.50      | 180                       | 0.620     | 4980                      | 3090                       | 321.0          | 0.7        |
|                                                                                   |                             | 11.80      | 180                       | 0.630     | 4855                      | 3060                       | 334.5          | 0.7        |
|                                                                                   |                             | 12.00      | 180                       | 0.640     | 4775                      | 3055                       | 345.5          | 0.7        |
|                                                                                   |                             |            |                           |           |                           |                            |                |            |
|                                                                                   | Aciers<br>500 - 850 N/mm²   | 10.00      | 160                       | 0.485     | 5095                      | 2470                       | 194.0          | 0.8        |
|                                                                                   |                             | 10.20      | 160                       | 0.495     | 4995                      | 2475                       | 202.0          | 0.9        |
|                                                                                   |                             | 10.50      | 160                       | 0.505     | 4850                      | 2450                       | 212.0          | 0.9        |
|                                                                                   |                             | 10.80      | 160                       | 0.520     | 4715                      | 2450                       | 224.5          | 0.9        |
|                                                                                   |                             | 11.00      | 160                       | 0.525     | 4630                      | 2430                       | 231.0          | 0.9        |
|                                                                                   |                             | 11.20      | 160                       | 0.530     | 4545                      | 2410                       | 237.5          | 0.9        |
|                                                                                   |                             | 11.50      | 160                       | 0.530     | 4430                      | 2350                       | 244.0          | 0.9        |
|                                                                                   |                             | 11.80      | 160                       | 0.540     | 4315                      | 2330                       | 255.0          | 0.9        |
|                                                                                   |                             | 12.00      | 160                       | 0.550     | 4245                      | 2335                       | 264.0          | 0.9        |
|                                                                                   |                             |            |                           |           |                           |                            |                |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | 10.00      | 140                       | 0.445     | 4455                      | 1980                       | 155.5          | 0.9        |
|                                                                                   |                             | 10.20      | 140                       | 0.455     | 4370                      | 1990                       | 162.5          | 1.1        |
|                                                                                   |                             | 10.50      | 140                       | 0.465     | 4245                      | 1975                       | 171.0          | 1.1        |
|                                                                                   |                             | 10.80      | 140                       | 0.475     | 4125                      | 1960                       | 179.5          | 1.1        |
|                                                                                   |                             | 11.00      | 140                       | 0.485     | 4050                      | 1965                       | 186.5          | 1.1        |
|                                                                                   |                             | 11.20      | 140                       | 0.485     | 3980                      | 1930                       | 190.0          | 1.1        |
|                                                                                   |                             | 11.50      | 140                       | 0.490     | 3875                      | 1900                       | 197.5          | 1.1        |
|                                                                                   |                             | 11.80      | 140                       | 0.495     | 3775                      | 1870                       | 204.5          | 1.2        |
|                                                                                   |                             | 12.00      | 140                       | 0.505     | 3715                      | 1875                       | 212.0          | 1.2        |
|                                                                                   |                             |            |                           |           |                           |                            |                |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm² | 10.00      | 100                       | 0.340     | 3185                      | 1085                       | 85.0           | 1.7        |
|                                                                                   |                             | 10.20      | 100                       | 0.345     | 3120                      | 1075                       | 88.0           | 2.1        |
|                                                                                   |                             | 10.50      | 100                       | 0.355     | 3030                      | 1075                       | 93.0           | 2.1        |
|                                                                                   |                             | 10.80      | 100                       | 0.365     | 2945                      | 1075                       | 98.5           | 2.1        |
|                                                                                   |                             | 11.00      | 100                       | 0.365     | 2895                      | 1055                       | 100.5          | 2.1        |
|                                                                                   |                             | 11.20      | 100                       | 0.370     | 2840                      | 1050                       | 103.5          | 2.1        |
|                                                                                   |                             | 11.50      | 100                       | 0.375     | 2770                      | 1040                       | 108.0          | 2.1        |
|                                                                                   |                             | 11.80      | 100                       | 0.380     | 2700                      | 1025                       | 112.0          | 2.1        |
|                                                                                   |                             | 12.00      | 100                       | 0.385     | 2655                      | 1020                       | 115.5          | 2.1        |
|                                                                                   |                             |            |                           |           |                           |                            |                |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm³/min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|----------------|------------|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 10.00      | 55                        | 0.260     | 1750                      | 455                        | 35.5           | 4.1        |
|                                                                                                                        | 10.20      | 55                        | 0.265     | 1715                      | 455                        | 37.0           | 4.9        |
|                                                                                                                        | 10.50      | 55                        | 0.275     | 1665                      | 460                        | 40.0           | 4.8        |
|                                                                                                                        | 10.80      | 55                        | 0.280     | 1620                      | 455                        | 41.5           | 4.9        |
|                                                                                                                        | 11.00      | 55                        | 0.285     | 1590                      | 455                        | 43.0           | 4.8        |
|                                                                                                                        | 11.20      | 55                        | 0.285     | 1565                      | 445                        | 44.0           | 4.9        |
|                                                                                                                        | 11.50      | 55                        | 0.285     | 1520                      | 435                        | 45.0           | 5.0        |
|                                                                                                                        | 11.80      | 55                        | 0.290     | 1485                      | 430                        | 47.0           | 5.1        |
|                                                                                                                        | 12.00      | 55                        | 0.295     | 1460                      | 430                        | 48.5           | 5.1        |
|                                                                                                                        |            |                           |           |                           |                            |                |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 10.00      | 70                        | 0.260     | 2230                      | 580                        | 45.5           | 3.2        |
|                                                                                                                        | 10.20      | 70                        | 0.265     | 2185                      | 580                        | 47.5           | 3.8        |
|                                                                                                                        | 10.50      | 70                        | 0.275     | 2120                      | 585                        | 50.5           | 3.8        |
|                                                                                                                        | 10.80      | 70                        | 0.280     | 2065                      | 580                        | 53.0           | 3.8        |
|                                                                                                                        | 11.00      | 70                        | 0.285     | 2025                      | 575                        | 54.5           | 3.8        |
|                                                                                                                        | 11.20      | 70                        | 0.285     | 1990                      | 565                        | 55.5           | 3.9        |
|                                                                                                                        | 11.50      | 70                        | 0.285     | 1940                      | 555                        | 57.5           | 3.9        |
|                                                                                                                        | 11.80      | 70                        | 0.290     | 1890                      | 550                        | 60.0           | 3.9        |
|                                                                                                                        | 12.00      | 70                        | 0.295     | 1855                      | 545                        | 61.5           | 4.0        |
|                                                                                                                        |            |                           |           |                           |                            |                |            |
| Titanes alliés trempés<br>>300 HB<br>[Ti6Al4V]                                                                         | 10.00      | 40                        | 0.260     | 1275                      | 330                        | 26.0           | 5.7        |
|                                                                                                                        | 10.20      | 40                        | 0.265     | 1250                      | 330                        | 27.0           | 6.8        |
|                                                                                                                        | 10.50      | 40                        | 0.275     | 1215                      | 335                        | 29.0           | 6.6        |
|                                                                                                                        | 10.80      | 40                        | 0.280     | 1180                      | 330                        | 30.0           | 6.7        |
|                                                                                                                        | 11.00      | 40                        | 0.285     | 1155                      | 330                        | 31.5           | 6.7        |
|                                                                                                                        | 11.20      | 40                        | 0.285     | 1135                      | 325                        | 32.0           | 6.7        |
|                                                                                                                        | 11.50      | 40                        | 0.285     | 1105                      | 315                        | 32.5           | 6.9        |
|                                                                                                                        | 11.80      | 40                        | 0.290     | 1080                      | 315                        | 34.5           | 6.9        |
|                                                                                                                        | 12.00      | 40                        | 0.295     | 1060                      | 315                        | 35.5           | 6.9        |
|                                                                                                                        |            |                           |           |                           |                            |                |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 10.00      | 240                       | 0.515     | 7640                      | 3935                       | 309.0          | 0.5        |
|                                                                                                                        | 10.20      | 240                       | 0.520     | 7490                      | 3895                       | 318.5          | 0.6        |
|                                                                                                                        | 10.50      | 240                       | 0.540     | 7275                      | 3930                       | 340.5          | 0.6        |
|                                                                                                                        | 10.80      | 240                       | 0.550     | 7075                      | 3890                       | 356.5          | 0.6        |
|                                                                                                                        | 11.00      | 240                       | 0.555     | 6945                      | 3855                       | 366.5          | 0.6        |
|                                                                                                                        | 11.20      | 240                       | 0.560     | 6820                      | 3820                       | 376.5          | 0.6        |
|                                                                                                                        | 11.50      | 240                       | 0.565     | 6645                      | 3755                       | 390.0          | 0.6        |
|                                                                                                                        | 11.80      | 240                       | 0.570     | 6475                      | 3690                       | 403.5          | 0.6        |
|                                                                                                                        | 12.00      | 240                       | 0.580     | 6365                      | 3690                       | 417.5          | 0.6        |
|                                                                                                                        |            |                           |           |                           |                            |                |            |

# Forets hélicoïdaux XDrill®

3xd



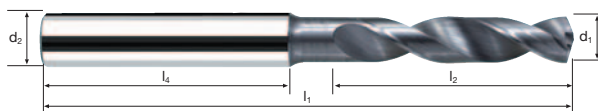
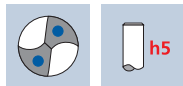
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 | HRC<br>48-56 |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|
|-------------|----------------|-----------------|-----------------|--------------|--|--|-------------------|----------------|-------|

| Exemple: N° cde     |          |          |     |    |    |                  | DURO-X |   |
|---------------------|----------|----------|-----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | B72011 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1  | l2 | l4 | L <sub>max</sub> |        |   |
| .0990               | 9.9      | 10       | 89  | 47 | 40 | 31.3             |        | ● |
| .1000               | 10.0     | 10       | 89  | 47 | 40 | 31.3             |        | ● |
| .1010               | 10.1     | 12       | 102 | 55 | 45 | 37.3             |        | ● |
| .1020               | 10.2     | 12       | 102 | 55 | 45 | 37.2             |        | ● |
| .1030               | 10.3     | 12       | 102 | 55 | 45 | 37.2             |        | ● |
| .1040               | 10.4     | 12       | 102 | 55 | 45 | 37.1             |        | ● |
| .1050               | 10.5     | 12       | 102 | 55 | 45 | 37.0             |        | ● |
| .1060               | 10.6     | 12       | 102 | 55 | 45 | 36.9             |        | ● |
| .1070               | 10.7     | 12       | 102 | 55 | 45 | 36.9             |        | ● |
| .1080               | 10.8     | 12       | 102 | 55 | 45 | 36.8             |        | ● |
| .1090               | 10.9     | 12       | 102 | 55 | 45 | 36.8             |        | ● |
| .1100               | 11.0     | 12       | 102 | 55 | 45 | 36.7             |        | ● |
| .1110               | 11.1     | 12       | 102 | 55 | 45 | 36.7             |        | ● |
| .1120               | 11.2     | 12       | 102 | 55 | 45 | 36.5             |        | ● |
| .1130               | 11.3     | 12       | 102 | 55 | 45 | 36.5             |        | ● |
| .1140               | 11.4     | 12       | 102 | 55 | 45 | 36.4             |        | ● |
| .1150               | 11.5     | 12       | 102 | 55 | 45 | 36.4             |        | ● |
| .1160               | 11.6     | 12       | 102 | 55 | 45 | 36.3             |        | ● |
| .1170               | 11.7     | 12       | 102 | 55 | 45 | 36.3             |        | ● |
| .1180               | 11.8     | 12       | 102 | 55 | 45 | 36.2             |        | ● |
| .1190               | 11.9     | 12       | 102 | 55 | 45 | 36.3             |        | ● |
| .1200               | 12.0     | 12       | 102 | 55 | 45 | 36.3             |        | ● |

| Application                                                                       | Matières                   | d1<br>[mm] | v <sub>c</sub><br>[m/min]   | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|----------------------------|------------|-----------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²      | 12.50      | 180                         | 0.665     | 4585                      | 3050                       | 374.5                       | 0.8        |
|                                                                                   |                            | 13.00      | 180                         | 0.695     | 4405                      | 3060                       | 406.0                       | 0.8        |
|                                                                                   |                            | 13.50      | 180                         | 0.705     | 4340                      | 3060                       | 419.0                       | 0.8        |
|                                                                                   |                            | 14.00      | 180                         | 0.715     | 4095                      | 2930                       | 451.0                       | 0.8        |
|                                                                                   |                            | 14.50      | 180                         | 0.725     | 3950                      | 2865                       | 473.0                       | 0.9        |
|                                                                                   |                            | 15.00      | 180                         | 0.745     | 3820                      | 2845                       | 503.0                       | 0.9        |
|                                                                                   |                            | 15.50      | 180                         | 0.760     | 3695                      | 2810                       | 530.0                       | 0.9        |
|                                                                                   |                            | 15.80      | 180                         | 0.770     | 3625                      | 2790                       | 547.0                       | 0.9        |
|                                                                                   |                            | 16.00      | 180                         | 0.775     | 3580                      | 2775                       | 558.0                       | 0.9        |
|                                                                                   |                            |            | Aciers<br>500 - 850 N/mm²   | 12.50     | 160                       | 0.570                      | 4075                        | 2325       |
| 13.00                                                                             | 160                        |            |                             | 0.595     | 3920                      | 2330                       | 309.5                       | 1.0        |
| 13.50                                                                             | 160                        |            |                             | 0.605     | 3860                      | 2335                       | 319.5                       | 1.0        |
| 14.00                                                                             | 160                        |            |                             | 0.610     | 3640                      | 2220                       | 341.5                       | 1.0        |
| 14.50                                                                             | 160                        |            |                             | 0.620     | 3510                      | 2175                       | 359.0                       | 1.1        |
| 15.00                                                                             | 160                        |            |                             | 0.640     | 3395                      | 2175                       | 384.5                       | 1.1        |
| 15.50                                                                             | 160                        |            |                             | 0.650     | 3285                      | 2135                       | 403.0                       | 1.1        |
| 15.80                                                                             | 160                        |            |                             | 0.660     | 3225                      | 2130                       | 417.5                       | 1.1        |
| 16.00                                                                             | 160                        |            |                             | 0.665     | 3185                      | 2120                       | 426.5                       | 1.1        |
|                                                                                   | Aciers<br>850 - 1100 N/mm² |            |                             | 12.50     | 140                       | 0.525                      | 3565                        | 1870       |
|                                                                                   |                            | 13.00      | 140                         | 0.545     | 3430                      | 1870                       | 248.0                       | 1.2        |
|                                                                                   |                            | 13.50      | 140                         | 0.555     | 3375                      | 1875                       | 256.5                       | 1.2        |
|                                                                                   |                            | 14.00      | 140                         | 0.565     | 3185                      | 1800                       | 277.0                       | 1.3        |
|                                                                                   |                            | 14.50      | 140                         | 0.570     | 3075                      | 1755                       | 290.0                       | 1.4        |
|                                                                                   |                            | 15.00      | 140                         | 0.590     | 2970                      | 1750                       | 309.5                       | 1.4        |
|                                                                                   |                            | 15.50      | 140                         | 0.600     | 2875                      | 1725                       | 325.5                       | 1.4        |
|                                                                                   |                            | 15.80      | 140                         | 0.605     | 2820                      | 1705                       | 334.5                       | 1.4        |
|                                                                                   |                            | 16.00      | 140                         | 0.610     | 2785                      | 1700                       | 342.0                       | 1.4        |
|                                                                                   |                            |            | Aciers<br>1100 - 1300 N/mm² | 12.50     | 100                       | 0.400                      | 2545                        | 1020       |
| 13.00                                                                             | 100                        |            |                             | 0.415     | 2450                      | 1015                       | 134.5                       | 2.3        |
| 13.50                                                                             | 100                        |            |                             | 0.420     | 2410                      | 1010                       | 138.0                       | 2.3        |
| 14.00                                                                             | 100                        |            |                             | 0.430     | 2275                      | 980                        | 151.0                       | 2.3        |
| 14.50                                                                             | 100                        |            |                             | 0.435     | 2195                      | 955                        | 157.5                       | 2.6        |
| 15.00                                                                             | 100                        |            |                             | 0.445     | 2120                      | 945                        | 167.0                       | 2.6        |
| 15.50                                                                             | 100                        |            |                             | 0.455     | 2055                      | 935                        | 176.5                       | 2.6        |
| 15.80                                                                             | 100                        |            |                             | 0.460     | 2015                      | 925                        | 181.5                       | 2.6        |
| 16.00                                                                             | 100                        |            |                             | 0.465     | 1990                      | 925                        | 186.0                       | 2.6        |

| Matières                                       | d1<br>[mm]                                                                                                             | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm²                    | 12.50                                                                                                                  | 55                        | 0.310     | 1400                      | 435                        | 53.5                        | 5.4        |
|                                                | 13.00                                                                                                                  | 55                        | 0.320     | 1345                      | 430                        | 57.0                        | 5.4        |
|                                                | 13.50                                                                                                                  | 55                        | 0.325     | 1325                      | 430                        | 59.0                        | 5.4        |
|                                                | 14.00                                                                                                                  | 55                        | 0.330     | 1250                      | 415                        | 64.0                        | 5.5        |
|                                                | 14.50                                                                                                                  | 55                        | 0.335     | 1205                      | 405                        | 67.0                        | 6.1        |
|                                                | 15.00                                                                                                                  | 55                        | 0.345     | 1165                      | 400                        | 70.5                        | 6.1        |
|                                                | 15.50                                                                                                                  | 55                        | 0.350     | 1130                      | 395                        | 74.5                        | 6.1        |
|                                                | 15.80                                                                                                                  | 55                        | 0.355     | 1110                      | 395                        | 77.5                        | 6.1        |
|                                                | 16.00                                                                                                                  | 55                        | 0.355     | 1095                      | 390                        | 78.5                        | 6.2        |
|                                                | Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 12.50                     | 70        | 0.310                     | 1785                       | 555                         | 68.0       |
| 13.00                                          |                                                                                                                        | 70                        | 0.320     | 1715                      | 550                        | 73.0                        | 4.2        |
| 13.50                                          |                                                                                                                        | 70                        | 0.325     | 1690                      | 550                        | 75.5                        | 4.2        |
| 14.00                                          |                                                                                                                        | 70                        | 0.330     | 1590                      | 525                        | 81.0                        | 4.4        |
| 14.50                                          |                                                                                                                        | 70                        | 0.335     | 1535                      | 515                        | 85.0                        | 4.8        |
| 15.00                                          |                                                                                                                        | 70                        | 0.345     | 1485                      | 510                        | 90.0                        | 4.8        |
| 15.50                                          |                                                                                                                        | 70                        | 0.350     | 1440                      | 505                        | 95.5                        | 4.8        |
| 15.80                                          |                                                                                                                        | 70                        | 0.355     | 1410                      | 500                        | 98.0                        | 4.8        |
| 16.00                                          |                                                                                                                        | 70                        | 0.355     | 1395                      | 495                        | 99.5                        | 4.9        |
| Titanes alliés trempés<br>>300 HB<br>[Ti6Al4V] |                                                                                                                        | 12.50                     | 40        | 0.310                     | 1020                       | 315                         | 38.5       |
|                                                | 13.00                                                                                                                  | 40                        | 0.320     | 980                       | 315                        | 42.0                        | 7.4        |
|                                                | 13.50                                                                                                                  | 40                        | 0.325     | 965                       | 315                        | 43.0                        | 7.3        |
|                                                | 14.00                                                                                                                  | 40                        | 0.330     | 910                       | 300                        | 46.0                        | 7.6        |
|                                                | 14.50                                                                                                                  | 40                        | 0.335     | 880                       | 295                        | 48.5                        | 8.3        |
|                                                | 15.00                                                                                                                  | 40                        | 0.345     | 850                       | 295                        | 52.0                        | 8.3        |
|                                                | 15.50                                                                                                                  | 40                        | 0.350     | 820                       | 285                        | 54.0                        | 8.5        |
|                                                | 15.80                                                                                                                  | 40                        | 0.355     | 805                       | 285                        | 56.0                        | 8.5        |
|                                                | 16.00                                                                                                                  | 40                        | 0.355     | 795                       | 280                        | 56.5                        | 8.6        |
|                                                | Fonte<br>grise / sphéroïdale                                                                                           | 12.50                     | 240       | 0.605                     | 6110                       | 3695                        | 453.5      |
| 13.00                                          |                                                                                                                        | 240                       | 0.630     | 5875                      | 3700                       | 491.0                       | 0.6        |
| 13.50                                          |                                                                                                                        | 240                       | 0.640     | 5785                      | 3700                       | 506.5                       | 0.6        |
| 14.00                                          |                                                                                                                        | 240                       | 0.650     | 5455                      | 3545                       | 545.5                       | 0.6        |
| 14.50                                          |                                                                                                                        | 240                       | 0.660     | 5270                      | 3480                       | 574.5                       | 0.7        |
| 15.00                                          |                                                                                                                        | 240                       | 0.675     | 5095                      | 3440                       | 608.0                       | 0.7        |
| 15.50                                          |                                                                                                                        | 240                       | 0.690     | 4930                      | 3400                       | 641.5                       | 0.7        |
| 15.80                                          |                                                                                                                        | 240                       | 0.700     | 4835                      | 3385                       | 663.5                       | 0.7        |
| 16.00                                          |                                                                                                                        | 240                       | 0.705     | 4775                      | 3365                       | 676.5                       | 0.7        |

3xd



|                    |                       |                        |                        |                     |  |  |                          |                       |              |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|--------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>GG(G)</b> |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|--------------|

[illegible]

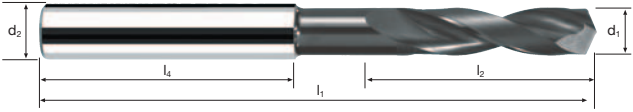
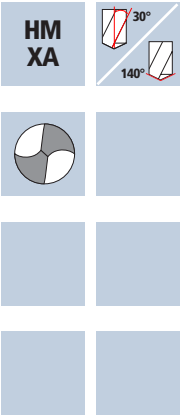


| Application                           | Matières | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|---------------------------------------|----------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers à outil trempés<br>42 - 48 HRC |          | 3.00       | 35                        | 0.060     | 3715                      | 225                        | 1.5                         | 4.3        |
|                                       |          | 4.00       | 35                        | 0.080     | 2785                      | 225                        | 3.0                         | 5.0        |
|                                       |          | 4.30       | 35                        | 0.085     | 2590                      | 220                        | 3.0                         | 5.1        |
|                                       |          | 5.00       | 35                        | 0.100     | 2230                      | 225                        | 4.5                         | 5.0        |
|                                       |          | 5.50       | 35                        | 0.110     | 2025                      | 225                        | 5.5                         | 4.9        |
|                                       |          | 6.00       | 35                        | 0.120     | 1855                      | 225                        | 6.5                         | 5.0        |
|                                       |          | 6.50       | 35                        | 0.130     | 1715                      | 225                        | 7.5                         | 7.7        |
|                                       |          | 6.90       | 35                        | 0.135     | 1615                      | 220                        | 8.0                         | 7.9        |
|                                       |          | 8.00       | 35                        | 0.155     | 1395                      | 215                        | 11.0                        | 8.0        |
|                                       |          | 3.00       | 30                        | 0.050     | 3185                      | 160                        | 1.0                         | 6.1        |
|                                       |          | 4.00       | 30                        | 0.065     | 2385                      | 155                        | 2.0                         | 7.3        |
|                                       |          | 4.30       | 30                        | 0.070     | 2220                      | 155                        | 2.5                         | 7.3        |
|                                       |          | 5.00       | 30                        | 0.085     | 1910                      | 160                        | 3.0                         | 7.1        |
|                                       |          | 5.50       | 30                        | 0.090     | 1735                      | 155                        | 3.5                         | 7.1        |
|                                       |          | 6.00       | 30                        | 0.100     | 1590                      | 160                        | 4.5                         | 7.0        |
|                                       |          | 6.50       | 30                        | 0.110     | 1470                      | 160                        | 5.5                         | 10.9       |
|                                       |          | 6.90       | 30                        | 0.115     | 1385                      | 160                        | 6.0                         | 10.8       |
|                                       |          | 8.00       | 30                        | 0.130     | 1195                      | 155                        | 8.0                         | 11.0       |
|                                       |          | 3.00       | 20                        | 0.045     | 2120                      | 95                         | 0.5                         | 10.2       |
|                                       |          | 4.00       | 20                        | 0.055     | 1590                      | 85                         | 1.0                         | 13.3       |
|                                       |          | 4.30       | 20                        | 0.060     | 1480                      | 90                         | 1.5                         | 12.5       |
|                                       |          | 5.00       | 20                        | 0.070     | 1275                      | 90                         | 2.0                         | 12.5       |
|                                       |          | 5.50       | 20                        | 0.080     | 1155                      | 90                         | 2.0                         | 12.3       |
|                                       |          | 6.00       | 20                        | 0.085     | 1060                      | 90                         | 2.5                         | 12.4       |
|                                       |          | 6.50       | 20                        | 0.095     | 980                       | 95                         | 3.0                         | 18.3       |
|                                       |          | 6.90       | 20                        | 0.080     | 925                       | 75                         | 3.0                         | 23.1       |
|                                       |          | 8.00       | 20                        | 0.085     | 795                       | 70                         | 3.5                         | 24.4       |
|                                       |          | 3.00       | 15                        | 0.020     | 1590                      | 30                         | 0.0                         | 32.4       |
|                                       |          | 4.00       | 15                        | 0.025     | 1195                      | 30                         | 0.5                         | 37.8       |
|                                       |          | 4.30       | 15                        | 0.025     | 1110                      | 30                         | 0.5                         | 37.5       |
|                                       |          | 5.00       | 15                        | 0.030     | 955                       | 30                         | 0.5                         | 37.6       |
|                                       |          | 5.50       | 15                        | 0.035     | 870                       | 30                         | 0.5                         | 36.9       |
|                                       |          | 6.00       | 15                        | 0.040     | 795                       | 30                         | 1.0                         | 37.2       |
|                                       |          | 6.50       | 15                        | 0.040     | 735                       | 30                         | 1.0                         | 58.1       |
|                                       |          | 6.90       | 15                        | 0.040     | 690                       | 30                         | 1.0                         | 57.7       |
|                                       |          | 8.00       | 15                        | 0.050     | 595                       | 30                         | 1.5                         | 57.0       |

| Matières                           | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers à outil trempés<br>> 60 HRC | 3.00       | 10                        | 0.015     | 1060                      | 15                         | 0.0                         | 64.8       |
|                                    | 4.00       | 10                        | 0.020     | 795                       | 15                         | 0.0                         | 75.6       |
|                                    | 4.30       | 10                        | 0.025     | 740                       | 20                         | 0.5                         | 56.3       |
|                                    | 5.00       | 10                        | 0.030     | 635                       | 20                         | 0.5                         | 56.4       |
|                                    | 5.50       | 10                        | 0.030     | 580                       | 15                         | 0.5                         | 73.8       |
|                                    | 6.00       | 10                        | 0.035     | 530                       | 20                         | 0.5                         | 55.8       |
|                                    | 6.50       | 10                        | 0.035     | 490                       | 15                         | 0.5                         | 116.2      |
|                                    | 6.90       | 10                        | 0.040     | 460                       | 20                         | 0.5                         | 86.6       |
|                                    | 8.00       | 10                        | 0.045     | 400                       | 20                         | 1.0                         | 85.5       |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |
|                                    |            |                           |           |                           |                            |                             |            |

# Forets hélicoïdaux Supradrill® HX

3xd



|  |  |  |                 |              |              |             |  |  |              |
|--|--|--|-----------------|--------------|--------------|-------------|--|--|--------------|
|  |  |  | Rm<br>1300-1500 | HRC<br>48-56 | HRC<br>56-60 | HRC<br>> 60 |  |  | HSS<br>GG(G) |
|--|--|--|-----------------|--------------|--------------|-------------|--|--|--------------|

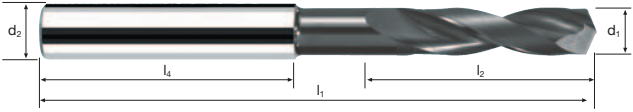
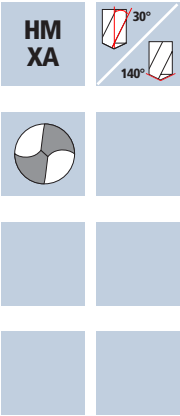
| Exemple:<br>N° cde  |          |          |    |    |    |                  | DURO-SD |   |
|---------------------|----------|----------|----|----|----|------------------|---------|---|
| N° d'article Code-ø |          |          |    |    |    |                  | B52111  |   |
| B52111 .0260        |          |          |    |    |    |                  | B53111  |   |
| ø<br>Code           | d1<br>m7 | d2<br>h6 | l1 | l2 | l4 | L <sub>max</sub> |         |   |
| .0260               | 2.60     | 6        | 62 | 20 | 36 | 14.8             |         | ● |
| .0300               | 3.00     | 6        | 62 | 20 | 36 | 16.2             |         | ● |
| .0340               | 3.40     | 6        | 62 | 20 | 36 | 15.8             |         | ● |
| .0350               | 3.50     | 6        | 62 | 20 | 36 | 15.8             |         | ● |
| .0400               | 4.00     | 6        | 66 | 24 | 36 | 18.9             |         | ● |
| .0420               | 4.20     | 6        | 66 | 24 | 36 | 18.8             |         | ● |
| .0430               | 4.30     | 6        | 66 | 24 | 36 | 18.8             |         | ● |
| .0450               | 4.50     | 6        | 66 | 24 | 36 | 18.6             |         | ● |
| .0500               | 5.00     | 6        | 66 | 28 | 36 | 18.8             |         | ● |
| .0510               | 5.10     | 6        | 66 | 28 | 36 | 18.8             |         | ● |
| .0520               | 5.20     | 6        | 66 | 28 | 36 | 18.7             |         | ● |
| .0550               | 5.50     | 6        | 66 | 28 | 36 | 18.5             |         | ● |
| .0560               | 5.60     | 6        | 66 | 28 | 36 | 18.5             |         | ● |
| .0600               | 6.00     | 6        | 66 | 28 | 36 | 18.6             |         | ● |
| .0650               | 6.50     | 8        | 79 | 34 | 36 | 29.1             |         | ● |
| .0670               | 6.70     | 8        | 79 | 34 | 36 | 29.0             |         | ● |
| .0690               | 6.90     | 8        | 79 | 34 | 36 | 28.9             |         | ● |
| .0700               | 7.00     | 8        | 79 | 34 | 36 | 28.8             |         | ● |
| .0710               | 7.10     | 8        | 79 | 41 | 36 | 28.7             |         | ● |
| .0750               | 7.50     | 8        | 79 | 41 | 36 | 28.5             |         | ● |
| .0800               | 8.00     | 8        | 79 | 41 | 36 | 28.5             |         | ● |
|                     |          |          |    |    |    |                  |         |   |
|                     |          |          |    |    |    |                  |         |   |

| Application                                                                       | Matières                              | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|---------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers à outil trempés<br>42 - 48 HRC | 8.60       | 35                        | 0.160     | 1295                      | 205                        | 12.0                        | 9.4        |
|                                                                                   |                                       | 9.00       | 35                        | 0.170     | 1240                      | 210                        | 13.5                        | 9.1        |
|                                                                                   |                                       | 10.00      | 35                        | 0.185     | 1115                      | 205                        | 16.0                        | 9.2        |
|                                                                                   |                                       | 10.40      | 35                        | 0.190     | 1070                      | 205                        | 17.5                        | 10.9       |
|                                                                                   |                                       | 11.00      | 35                        | 0.195     | 1015                      | 200                        | 19.0                        | 11.0       |
|                                                                                   |                                       | 12.00      | 35                        | 0.210     | 930                       | 195                        | 22.0                        | 11.2       |
|                                                                                   |                                       | 12.20      | 35                        | 0.210     | 915                       | 190                        | 22.0                        | 12.4       |
|                                                                                   |                                       | 13.00      | 35                        | 0.220     | 855                       | 190                        | 25.0                        | 12.2       |
|                                                                                   | Aciers à outil trempés<br>48 - 52 HRC | 14.00      | 35                        | 0.235     | 795                       | 185                        | 28.5                        | 12.5       |
|                                                                                   |                                       | 8.60       | 30                        | 0.135     | 1110                      | 150                        | 8.5                         | 12.8       |
|                                                                                   |                                       | 9.00       | 30                        | 0.140     | 1060                      | 150                        | 9.5                         | 12.7       |
|                                                                                   |                                       | 10.00      | 30                        | 0.155     | 955                       | 150                        | 12.0                        | 12.6       |
|                                                                                   |                                       | 10.40      | 30                        | 0.155     | 920                       | 145                        | 12.5                        | 15.4       |
|                                                                                   |                                       | 11.00      | 30                        | 0.165     | 870                       | 145                        | 14.0                        | 15.2       |
|                                                                                   |                                       | 12.00      | 30                        | 0.175     | 795                       | 140                        | 16.0                        | 15.6       |
|                                                                                   |                                       | 12.20      | 30                        | 0.175     | 785                       | 135                        | 16.0                        | 17.4       |
|                                                                                   | Aciers à outil trempés<br>52 - 56 HRC | 13.00      | 30                        | 0.185     | 735                       | 135                        | 18.0                        | 17.2       |
|                                                                                   |                                       | 14.00      | 30                        | 0.195     | 680                       | 135                        | 21.0                        | 17.1       |
|                                                                                   |                                       | 8.60       | 20                        | 0.090     | 740                       | 65                         | 4.0                         | 29.5       |
|                                                                                   |                                       | 9.00       | 20                        | 0.095     | 705                       | 65                         | 4.0                         | 29.3       |
|                                                                                   |                                       | 10.00      | 20                        | 0.100     | 635                       | 65                         | 5.0                         | 29.1       |
|                                                                                   |                                       | 10.40      | 20                        | 0.100     | 610                       | 60                         | 5.0                         | 37.1       |
|                                                                                   |                                       | 11.00      | 20                        | 0.105     | 580                       | 60                         | 5.5                         | 36.7       |
|                                                                                   |                                       | 12.00      | 20                        | 0.110     | 530                       | 60                         | 7.0                         | 36.4       |
|                                                                                   | Aciers à outil trempés<br>56 - 60 HRC | 12.20      | 20                        | 0.110     | 520                       | 55                         | 6.5                         | 42.8       |
|                                                                                   |                                       | 13.00      | 20                        | 0.115     | 490                       | 55                         | 7.5                         | 42.2       |
|                                                                                   |                                       | 14.00      | 20                        | 0.125     | 455                       | 55                         | 8.5                         | 41.9       |
|                                                                                   |                                       | 8.60       | 15                        | 0.050     | 555                       | 30                         | 1.5                         | 64.0       |
|                                                                                   |                                       | 9.00       | 15                        | 0.050     | 530                       | 25                         | 1.5                         | 76.1       |
|                                                                                   |                                       | 10.00      | 15                        | 0.055     | 475                       | 25                         | 2.0                         | 75.6       |
|                                                                                   |                                       | 10.40      | 15                        | 0.060     | 460                       | 30                         | 2.5                         | 74.2       |
|                                                                                   |                                       | 11.00      | 15                        | 0.060     | 435                       | 25                         | 2.5                         | 88.1       |
|                                                                                   |                                       | 12.00      | 15                        | 0.065     | 400                       | 25                         | 3.0                         | 87.4       |
|                                                                                   |                                       | 12.20      | 15                        | 0.065     | 390                       | 25                         | 3.0                         | 94.1       |
|                                                                                   |                                       | 13.00      | 15                        | 0.070     | 365                       | 25                         | 3.5                         | 92.9       |
|                                                                                   |                                       | 14.00      | 15                        | 0.075     | 340                       | 25                         | 4.0                         | 92.2       |
|                                                                                   |                                       | 8.60       | 10                        | 0.045     | 370                       | 15                         | 1.0                         | 128.0      |
|                                                                                   |                                       | 9.00       | 10                        | 0.045     | 355                       | 15                         | 1.0                         | 126.8      |
|                                                                                   |                                       | 10.00      | 10                        | 0.050     | 320                       | 15                         | 1.0                         | 126.0      |
|                                                                                   |                                       | 10.40      | 10                        | 0.050     | 305                       | 15                         | 1.5                         | 148.4      |
|                                                                                   |                                       | 11.00      | 10                        | 0.055     | 290                       | 15                         | 1.5                         | 146.8      |
|                                                                                   |                                       | 12.00      | 10                        | 0.060     | 265                       | 15                         | 1.5                         | 145.6      |
|                                                                                   |                                       | 12.20      | 10                        | 0.060     | 260                       | 15                         | 2.0                         | 156.8      |
|                                                                                   |                                       | 13.00      | 10                        | 0.060     | 245                       | 15                         | 2.0                         | 154.8      |
|                                                                                   |                                       | 14.00      | 10                        | 0.065     | 225                       | 15                         | 2.5                         | 153.6      |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |



# Forets hélicoïdaux Supradrill® HX

3xd



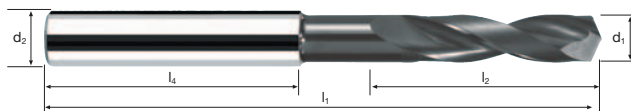
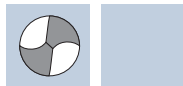
|  |  |  |                        |                     |                     |                    |  |  |                            |
|--|--|--|------------------------|---------------------|---------------------|--------------------|--|--|----------------------------|
|  |  |  | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 | <b>HRC</b><br>56-60 | <b>HRC</b><br>> 60 |  |  | <b>HSS</b><br><b>GG(G)</b> |
|--|--|--|------------------------|---------------------|---------------------|--------------------|--|--|----------------------------|

| Exemple: N° cde     |          |          |     |    |    |                  | DURO-SD       |   |
|---------------------|----------|----------|-----|----|----|------------------|---------------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | <b>B52111</b> |   |
| <b>B52111 .0810</b> |          |          |     |    |    |                  | <b>B53111</b> |   |
| ø<br>Code           | d1<br>m7 | d2<br>h6 | l1  | l2 | l4 | L <sub>max</sub> |               |   |
| .0810               | 8.10     | 10       | 89  | 47 | 40 | 32.4             |               | ● |
| .0850               | 8.50     | 10       | 89  | 47 | 40 | 32.1             |               | ● |
| .0860               | 8.60     | 10       | 89  | 47 | 40 | 32.0             |               | ● |
| .0885               | 8.85     | 10       | 89  | 47 | 40 | 31.8             |               | ● |
| .0900               | 9.00     | 10       | 89  | 47 | 40 | 31.7             |               | ● |
| .0910               | 9.10     | 10       | 89  | 47 | 40 | 31.7             |               | ● |
| .0950               | 9.50     | 10       | 89  | 47 | 40 | 31.5             |               | ● |
| .1000               | 10.00    | 10       | 89  | 47 | 40 | 31.5             |               | ● |
| .1030               | 10.30    | 12       | 102 | 55 | 45 | 37.2             |               | ● |
| .1040               | 10.40    | 12       | 102 | 55 | 45 | 37.1             |               | ● |
| .1050               | 10.50    | 12       | 102 | 55 | 45 | 37.1             |               | ● |
| .1070               | 10.70    | 12       | 102 | 55 | 45 | 37.0             |               | ● |
| .1100               | 11.00    | 12       | 102 | 55 | 45 | 36.7             |               | ● |
| .1150               | 11.50    | 12       | 102 | 55 | 45 | 36.5             |               | ● |
| .1160               | 11.60    | 12       | 102 | 55 | 45 | 36.4             |               | ● |
| .1190               | 11.90    | 12       | 102 | 55 | 45 | 36.4             |               | ● |
| .1200               | 12.00    | 12       | 102 | 55 | 45 | 36.4             |               | ● |
| .1210               | 12.10    | 14       | 107 | 60 | 45 | 39.3             |               | ● |
| .1220               | 12.20    | 14       | 107 | 60 | 45 | 39.2             |               | ● |
| .1250               | 12.50    | 14       | 107 | 60 | 45 | 39.1             |               | ● |
| .1270               | 12.70    | 14       | 107 | 60 | 45 | 39.0             |               | ● |
| .1300               | 13.00    | 14       | 107 | 60 | 45 | 38.7             |               | ● |
| .1400               | 14.00    | 14       | 107 | 60 | 45 | 38.4             |               | ● |

| Application                                                                       | Matières                              | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|---------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers à outil trempés<br>42 - 48 HRC | 14.10      | 35                        | 0.235     | 790                       | 185                        | 29.0                        | 13.4       |
|                                                                                   |                                       | 14.20      | 35                        | 0.235     | 785                       | 185                        | 29.5                        | 13.4       |
|                                                                                   |                                       | 14.70      | 35                        | 0.245     | 760                       | 185                        | 31.5                        | 13.3       |
|                                                                                   |                                       | 15.00      | 35                        | 0.245     | 745                       | 185                        | 32.5                        | 13.2       |
|                                                                                   |                                       | 15.40      | 35                        | 0.250     | 725                       | 180                        | 33.5                        | 13.5       |
|                                                                                   |                                       | 16.00      | 35                        | 0.260     | 695                       | 180                        | 36.0                        | 13.5       |
|                                                                                   |                                       | 19.20      | 35                        | 0.310     | 580                       | 180                        | 52.0                        | 16.2       |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers à outil trempés<br>48 - 52 HRC | 14.10      | 30                        | 0.195     | 675                       | 130                        | 20.5                        | 19.0       |
|                                                                                   |                                       | 14.20      | 30                        | 0.195     | 670                       | 130                        | 20.5                        | 19.0       |
|                                                                                   |                                       | 14.70      | 30                        | 0.205     | 650                       | 135                        | 23.0                        | 18.2       |
|                                                                                   |                                       | 15.00      | 30                        | 0.205     | 635                       | 130                        | 23.0                        | 18.8       |
|                                                                                   |                                       | 15.40      | 30                        | 0.210     | 620                       | 130                        | 24.0                        | 18.7       |
|                                                                                   |                                       | 16.00      | 30                        | 0.215     | 595                       | 130                        | 26.0                        | 18.6       |
|                                                                                   |                                       | 19.20      | 30                        | 0.260     | 495                       | 130                        | 37.5                        | 22.4       |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers à outil trempés<br>52 - 56 HRC | 14.10      | 20                        | 0.125     | 450                       | 55                         | 8.5                         | 45.0       |
|                                                                                   |                                       | 14.20      | 20                        | 0.125     | 450                       | 55                         | 8.5                         | 44.9       |
|                                                                                   |                                       | 14.70      | 20                        | 0.130     | 435                       | 55                         | 9.5                         | 44.7       |
|                                                                                   |                                       | 15.00      | 20                        | 0.130     | 425                       | 55                         | 9.5                         | 44.4       |
|                                                                                   |                                       | 15.40      | 20                        | 0.135     | 415                       | 55                         | 10.0                        | 44.2       |
|                                                                                   |                                       | 16.00      | 20                        | 0.135     | 400                       | 55                         | 11.0                        | 44.1       |
|                                                                                   |                                       | 19.20      | 20                        | 0.165     | 330                       | 55                         | 16.0                        | 53.0       |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers à outil trempés<br>56 - 60 HRC | 14.10      | 15                        | 0.075     | 340                       | 25                         | 4.0                         | 99.0       |
|                                                                                   |                                       | 14.20      | 15                        | 0.075     | 335                       | 25                         | 4.0                         | 98.9       |
|                                                                                   |                                       | 14.70      | 15                        | 0.075     | 325                       | 25                         | 4.0                         | 98.3       |
|                                                                                   |                                       | 15.00      | 15                        | 0.075     | 320                       | 25                         | 4.5                         | 97.7       |
|                                                                                   |                                       | 15.40      | 15                        | 0.080     | 310                       | 25                         | 4.5                         | 97.2       |
|                                                                                   |                                       | 16.00      | 15                        | 0.080     | 300                       | 25                         | 5.0                         | 97.0       |
|                                                                                   |                                       | 19.20      | 15                        | 0.095     | 250                       | 25                         | 7.0                         | 116.6      |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   | Matières                              | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|                                                                                   | Aciers à outil trempés<br>> 60 HRC    | 14.10      | 10                        | 0.065     | 225                       | 15                         | 2.5                         | 165.0      |
|                                                                                   |                                       | 14.20      | 10                        | 0.065     | 225                       | 15                         | 2.5                         | 164.8      |
|                                                                                   |                                       | 14.70      | 10                        | 0.070     | 215                       | 15                         | 2.5                         | 163.8      |
|                                                                                   |                                       | 15.00      | 10                        | 0.070     | 210                       | 15                         | 2.5                         | 162.8      |
|                                                                                   |                                       | 15.40      | 10                        | 0.070     | 205                       | 15                         | 3.0                         | 162.0      |
|                                                                                   |                                       | 16.00      | 10                        | 0.070     | 200                       | 15                         | 3.0                         | 161.6      |
|                                                                                   |                                       | 19.20      | 10                        | 0.085     | 165                       | 15                         | 4.5                         | 194.4      |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                       |            |                           |           |                           |                            |                             |            |

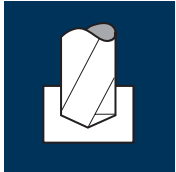
# Forets hélicoïdaux Supradrill® HX

3xd



|  |  |  |                        |                     |                     |                    |  |  |                            |
|--|--|--|------------------------|---------------------|---------------------|--------------------|--|--|----------------------------|
|  |  |  | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 | <b>HRC</b><br>56-60 | <b>HRC</b><br>> 60 |  |  | <b>HSS</b><br><b>GG(G)</b> |
|--|--|--|------------------------|---------------------|---------------------|--------------------|--|--|----------------------------|

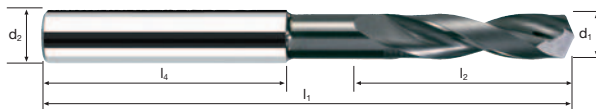
[illegible]

| Application                                                                      | Matières                                | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|----------------------------------------------------------------------------------|-----------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>       | 3.00       | 170                       | 0.085     | 18040                     | 1535                       | 11.0                        | 0.6        |
|                                                                                  |                                         | 3.30       | 170                       | 0.095     | 16400                     | 1560                       | 13.5                        | 0.6        |
|                                                                                  |                                         | 3.50       | 170                       | 0.100     | 15460                     | 1545                       | 15.0                        | 0.6        |
|                                                                                  |                                         | 4.00       | 170                       | 0.115     | 13530                     | 1555                       | 19.5                        | 0.7        |
|                                                                                  |                                         | 4.20       | 170                       | 0.120     | 12885                     | 1545                       | 21.5                        | 0.7        |
|                                                                                  |                                         | 5.00       | 170                       | 0.145     | 10825                     | 1570                       | 31.0                        | 0.7        |
|                                                                                  |                                         | 6.00       | 170                       | 0.170     | 9020                      | 1535                       | 43.5                        | 0.7        |
|                                                                                  |                                         | 6.80       | 170                       | 0.195     | 7960                      | 1550                       | 56.5                        | 1.1        |
|                                                                                  |                                         | 8.50       | 170                       | 0.245     | 6365                      | 1560                       | 88.5                        | 1.2        |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup>   | 3.00       | 130                       | 0.085     | 13795                     | 1175                       | 8.5                         | 0.8        |
|                                                                                  |                                         | 3.30       | 130                       | 0.095     | 12540                     | 1190                       | 10.0                        | 0.8        |
|                                                                                  |                                         | 3.50       | 130                       | 0.100     | 11825                     | 1185                       | 11.5                        | 0.8        |
|                                                                                  |                                         | 4.00       | 130                       | 0.115     | 10345                     | 1190                       | 15.0                        | 1.0        |
|                                                                                  |                                         | 4.20       | 130                       | 0.120     | 9850                      | 1180                       | 16.5                        | 1.0        |
|                                                                                  |                                         | 5.00       | 130                       | 0.145     | 8275                      | 1200                       | 23.5                        | 0.9        |
|                                                                                  |                                         | 6.00       | 130                       | 0.170     | 6895                      | 1170                       | 33.0                        | 1.0        |
|                                                                                  |                                         | 6.80       | 130                       | 0.195     | 6085                      | 1185                       | 43.0                        | 1.5        |
|                                                                                  |                                         | 8.50       | 130                       | 0.245     | 4870                      | 1195                       | 68.0                        | 1.6        |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | 3.00       | 110                       | 0.065     | 11670                     | 760                        | 5.5                         | 1.3        |
|                                                                                  |                                         | 3.30       | 110                       | 0.075     | 10610                     | 795                        | 7.0                         | 1.2        |
|                                                                                  |                                         | 3.50       | 110                       | 0.080     | 10005                     | 800                        | 7.5                         | 1.2        |
|                                                                                  |                                         | 4.00       | 110                       | 0.090     | 8755                      | 790                        | 10.0                        | 1.4        |
|                                                                                  |                                         | 4.20       | 110                       | 0.095     | 8335                      | 790                        | 11.0                        | 1.4        |
|                                                                                  |                                         | 5.00       | 110                       | 0.110     | 7005                      | 770                        | 15.0                        | 1.5        |
|                                                                                  |                                         | 6.00       | 110                       | 0.135     | 5835                      | 790                        | 22.5                        | 1.4        |
|                                                                                  |                                         | 6.80       | 110                       | 0.150     | 5150                      | 775                        | 28.0                        | 2.2        |
|                                                                                  |                                         | 8.50       | 110                       | 0.190     | 4120                      | 785                        | 44.5                        | 2.4        |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                  | Aciers<br>1100 - 1300 N/mm <sup>2</sup> | 3.00       | 70                        | 0.055     | 7425                      | 410                        | 3.0                         | 2.4        |
|                                                                                  |                                         | 3.30       | 70                        | 0.060     | 6750                      | 405                        | 3.5                         | 2.4        |
|                                                                                  |                                         | 3.50       | 70                        | 0.060     | 6365                      | 380                        | 3.5                         | 2.5        |
|                                                                                  |                                         | 4.00       | 70                        | 0.070     | 5570                      | 390                        | 5.0                         | 2.9        |
|                                                                                  |                                         | 4.20       | 70                        | 0.075     | 5305                      | 400                        | 5.5                         | 2.8        |
|                                                                                  |                                         | 5.00       | 70                        | 0.090     | 4455                      | 400                        | 8.0                         | 2.8        |
|                                                                                  |                                         | 6.00       | 70                        | 0.105     | 3715                      | 390                        | 11.0                        | 2.9        |
|                                                                                  |                                         | 6.80       | 70                        | 0.120     | 3275                      | 395                        | 14.5                        | 4.4        |
|                                                                                  |                                         | 8.50       | 70                        | 0.150     | 2620                      | 395                        | 22.5                        | 4.9        |
|                                                                                  |                                         |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm <sup>2</sup>                                                                                | 3.00       | 40                        | 0.045     | 4245                      | 190                        | 1.5                         | 5.1        |
|                                                                                                                        | 3.30       | 40                        | 0.045     | 3860                      | 175                        | 1.5                         | 5.5        |
|                                                                                                                        | 3.50       | 40                        | 0.050     | 3640                      | 180                        | 1.5                         | 5.3        |
|                                                                                                                        | 4.00       | 40                        | 0.055     | 3185                      | 175                        | 2.0                         | 6.5        |
|                                                                                                                        | 4.20       | 40                        | 0.060     | 3030                      | 180                        | 2.5                         | 6.3        |
|                                                                                                                        | 5.00       | 40                        | 0.070     | 2545                      | 180                        | 3.5                         | 6.3        |
|                                                                                                                        | 6.00       | 40                        | 0.085     | 2120                      | 180                        | 5.0                         | 6.2        |
|                                                                                                                        | 6.80       | 40                        | 0.095     | 1870                      | 180                        | 6.5                         | 9.6        |
|                                                                                                                        | 8.50       | 40                        | 0.120     | 1500                      | 180                        | 10.0                        | 10.7       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 3.00       | 60                        | 0.045     | 6365                      | 285                        | 2.0                         | 3.4        |
|                                                                                                                        | 3.30       | 60                        | 0.050     | 5785                      | 290                        | 2.5                         | 3.3        |
|                                                                                                                        | 3.50       | 60                        | 0.050     | 5455                      | 275                        | 2.5                         | 3.4        |
|                                                                                                                        | 4.00       | 60                        | 0.060     | 4775                      | 285                        | 3.5                         | 4.0        |
|                                                                                                                        | 4.20       | 60                        | 0.065     | 4545                      | 295                        | 4.0                         | 3.8        |
|                                                                                                                        | 5.00       | 60                        | 0.075     | 3820                      | 285                        | 5.5                         | 4.0        |
|                                                                                                                        | 6.00       | 60                        | 0.090     | 3185                      | 285                        | 8.0                         | 3.9        |
|                                                                                                                        | 6.80       | 60                        | 0.100     | 2810                      | 280                        | 10.0                        | 6.2        |
|                                                                                                                        | 8.50       | 60                        | 0.125     | 2245                      | 280                        | 16.0                        | 6.9        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 3.00       | 220                       | 0.095     | 23345                     | 2220                       | 15.5                        | 0.4        |
|                                                                                                                        | 3.30       | 220                       | 0.105     | 21220                     | 2230                       | 19.0                        | 0.4        |
|                                                                                                                        | 3.50       | 220                       | 0.110     | 20010                     | 2200                       | 21.0                        | 0.4        |
|                                                                                                                        | 4.00       | 220                       | 0.125     | 17505                     | 2190                       | 27.5                        | 0.5        |
|                                                                                                                        | 4.20       | 220                       | 0.130     | 16675                     | 2170                       | 30.0                        | 0.5        |
|                                                                                                                        | 5.00       | 220                       | 0.155     | 14005                     | 2170                       | 42.5                        | 0.5        |
|                                                                                                                        | 6.00       | 220                       | 0.190     | 11670                     | 2215                       | 62.5                        | 0.5        |
|                                                                                                                        | 6.80       | 220                       | 0.215     | 10300                     | 2215                       | 80.5                        | 0.8        |
|                                                                                                                        | 8.50       | 220                       | 0.265     | 8240                      | 2185                       | 124.0                       | 0.9        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aluminium corroyé<br>Si < 6%                                                                                           | 3.00       | 250                       | 0.085     | 26525                     | 2255                       | 16.0                        | 0.4        |
|                                                                                                                        | 3.30       | 250                       | 0.095     | 24115                     | 2290                       | 19.5                        | 0.4        |
|                                                                                                                        | 3.50       | 250                       | 0.100     | 22735                     | 2275                       | 22.0                        | 0.4        |
|                                                                                                                        | 4.00       | 250                       | 0.115     | 19895                     | 2290                       | 29.0                        | 0.5        |
|                                                                                                                        | 4.20       | 250                       | 0.120     | 18945                     | 2275                       | 31.5                        | 0.5        |
|                                                                                                                        | 5.00       | 250                       | 0.145     | 15915                     | 2310                       | 45.5                        | 0.5        |
|                                                                                                                        | 6.00       | 250                       | 0.170     | 13265                     | 2255                       | 64.0                        | 0.5        |
|                                                                                                                        | 6.80       | 250                       | 0.195     | 11705                     | 2280                       | 83.0                        | 0.8        |
|                                                                                                                        | 8.50       | 250                       | 0.245     | 9360                      | 2295                       | 130.0                       | 0.8        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

# Forets hélicoïdaux Supradrill® U

3xd



|             |                |                 |                 |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|--|--------------------|

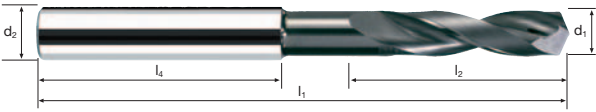
| Exemple: N° cde <b>B62011 .0300</b><br><small>N° d'article Code-ø</small> |          |          |    |    |    |                  | NANO-U <sup>2</sup> |               |
|---------------------------------------------------------------------------|----------|----------|----|----|----|------------------|---------------------|---------------|
|                                                                           |          |          |    |    |    |                  |                     | <b>B62011</b> |
|                                                                           |          |          |    |    |    |                  |                     | <b>B63011</b> |
| ø<br>Code                                                                 | d1<br>m7 | d2<br>h6 | l1 | l2 | l4 | L <sub>max</sub> |                     |               |
| .0300                                                                     | 3.0      | 6        | 62 | 20 | 36 | 16.2             |                     | ●             |
| .0330                                                                     | 3.3      | 6        | 62 | 20 | 36 | 16.0             |                     | ●             |
| .0340                                                                     | 3.4      | 6        | 62 | 20 | 36 | 15.8             |                     | ●             |
| .0350                                                                     | 3.5      | 6        | 62 | 20 | 36 | 15.8             |                     | ●             |
| .0370                                                                     | 3.7      | 6        | 62 | 20 | 36 | 15.6             |                     | ●             |
| .0380                                                                     | 3.8      | 6        | 66 | 24 | 36 | 19.4             |                     | ●             |
| .0400                                                                     | 4.0      | 6        | 66 | 24 | 36 | 18.9             |                     | ●             |
| .0420                                                                     | 4.2      | 6        | 66 | 24 | 36 | 18.8             |                     | ●             |
| .0450                                                                     | 4.5      | 6        | 66 | 24 | 36 | 18.6             |                     | ●             |
| .0480                                                                     | 4.8      | 6        | 66 | 28 | 36 | 18.4             |                     | ●             |
| .0500                                                                     | 5.0      | 6        | 66 | 28 | 36 | 18.8             |                     | ●             |
| .0550                                                                     | 5.5      | 6        | 66 | 28 | 36 | 18.5             |                     | ●             |
| .0580                                                                     | 5.8      | 6        | 66 | 28 | 36 | 18.4             |                     | ●             |
| .0600                                                                     | 6.0      | 6        | 66 | 28 | 36 | 18.6             |                     | ●             |
| .0650                                                                     | 6.5      | 8        | 79 | 34 | 36 | 29.1             |                     | ●             |
| .0680                                                                     | 6.8      | 8        | 79 | 34 | 36 | 28.9             |                     | ●             |
| .0700                                                                     | 7.0      | 8        | 79 | 34 | 36 | 28.8             |                     | ●             |
| .0750                                                                     | 7.5      | 8        | 79 | 41 | 36 | 28.5             |                     | ●             |
| .0780                                                                     | 7.8      | 8        | 79 | 41 | 36 | 28.4             |                     | ●             |
| .0800                                                                     | 8.0      | 8        | 79 | 41 | 36 | 28.5             |                     | ●             |
| .0850                                                                     | 8.5      | 10       | 89 | 47 | 40 | 32.1             |                     | ●             |
| .0880                                                                     | 8.8      | 10       | 89 | 47 | 40 | 31.9             |                     | ●             |
| .0900                                                                     | 9.0      | 10       | 89 | 47 | 40 | 31.7             |                     | ●             |

| Application                                                                      | Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>                                                                                      | 10.00      | 170                       | 0.285     | 5410                      | 1540                       | 121.0                       | 1.2        |
|                                                                                  |                                                                                                                        | 10.20      | 170                       | 0.290     | 5305                      | 1540                       | 126.0                       | 1.4        |
|                                                                                  |                                                                                                                        | 11.00      | 170                       | 0.315     | 4920                      | 1550                       | 147.5                       | 1.4        |
|                                                                                  |                                                                                                                        | 12.00      | 170                       | 0.345     | 4510                      | 1555                       | 176.0                       | 1.4        |
|                                                                                  |                                                                                                                        | 13.00      | 170                       | 0.370     | 4165                      | 1540                       | 204.5                       | 1.5        |
|                                                                                  |                                                                                                                        | 14.00      | 170                       | 0.400     | 3865                      | 1545                       | 238.0                       | 1.5        |
|                                                                                  |                                                                                                                        | 15.00      | 170                       | 0.430     | 3610                      | 1550                       | 274.0                       | 1.6        |
|                                                                                  |                                                                                                                        | 15.50      | 170                       | 0.445     | 3490                      | 1555                       | 293.5                       | 1.6        |
|                                                                                  |                                                                                                                        | 16.00      | 170                       | 0.455     | 3380                      | 1540                       | 309.5                       | 1.6        |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup>                                                                                  | 10.00      | 130                       | 0.285     | 4140                      | 1180                       | 92.5                        | 1.6        |
|                                                                                  |                                                                                                                        | 10.20      | 130                       | 0.290     | 4055                      | 1175                       | 96.0                        | 1.9        |
|                                                                                  |                                                                                                                        | 11.00      | 130                       | 0.315     | 3760                      | 1185                       | 112.5                       | 1.9        |
|                                                                                  |                                                                                                                        | 12.00      | 130                       | 0.345     | 3450                      | 1190                       | 134.5                       | 1.8        |
|                                                                                  |                                                                                                                        | 13.00      | 130                       | 0.370     | 3185                      | 1180                       | 156.5                       | 2.0        |
|                                                                                  |                                                                                                                        | 14.00      | 130                       | 0.400     | 2955                      | 1180                       | 181.5                       | 2.0        |
|                                                                                  |                                                                                                                        | 15.00      | 130                       | 0.430     | 2760                      | 1185                       | 209.5                       | 2.1        |
|                                                                                  |                                                                                                                        | 15.50      | 130                       | 0.445     | 2670                      | 1190                       | 224.5                       | 2.0        |
|                                                                                  |                                                                                                                        | 16.00      | 130                       | 0.455     | 2585                      | 1175                       | 236.0                       | 2.1        |
|                                                                                  | Aciers<br>850 - 1100 N/mm <sup>2</sup>                                                                                 | 10.00      | 110                       | 0.220     | 3500                      | 770                        | 60.5                        | 2.5        |
|                                                                                  |                                                                                                                        | 10.20      | 110                       | 0.225     | 3435                      | 775                        | 63.5                        | 2.9        |
|                                                                                  |                                                                                                                        | 11.00      | 110                       | 0.245     | 3185                      | 780                        | 74.0                        | 2.8        |
|                                                                                  |                                                                                                                        | 12.00      | 110                       | 0.265     | 2920                      | 775                        | 87.5                        | 2.8        |
|                                                                                  |                                                                                                                        | 13.00      | 110                       | 0.290     | 2695                      | 780                        | 103.5                       | 3.0        |
|                                                                                  |                                                                                                                        | 14.00      | 110                       | 0.310     | 2500                      | 775                        | 119.5                       | 3.0        |
|                                                                                  |                                                                                                                        | 15.00      | 110                       | 0.335     | 2335                      | 780                        | 138.0                       | 3.1        |
|                                                                                  |                                                                                                                        | 15.50      | 110                       | 0.345     | 2260                      | 780                        | 147.0                       | 3.1        |
|                                                                                  |                                                                                                                        | 16.00      | 110                       | 0.355     | 2190                      | 775                        | 156.0                       | 3.1        |
|                                                                                  | Aciers<br>1100 - 1300 N/mm <sup>2</sup>                                                                                | 10.00      | 70                        | 0.175     | 2230                      | 390                        | 30.5                        | 4.8        |
|                                                                                  |                                                                                                                        | 10.20      | 70                        | 0.180     | 2185                      | 395                        | 32.5                        | 5.7        |
|                                                                                  |                                                                                                                        | 11.00      | 70                        | 0.195     | 2025                      | 395                        | 37.5                        | 5.6        |
|                                                                                  |                                                                                                                        | 12.00      | 70                        | 0.210     | 1855                      | 390                        | 44.0                        | 5.6        |
|                                                                                  |                                                                                                                        | 13.00      | 70                        | 0.230     | 1715                      | 395                        | 52.5                        | 5.9        |
|                                                                                  |                                                                                                                        | 14.00      | 70                        | 0.245     | 1590                      | 390                        | 60.0                        | 5.9        |
|                                                                                  |                                                                                                                        | 15.00      | 70                        | 0.265     | 1485                      | 395                        | 70.0                        | 6.2        |
|                                                                                  |                                                                                                                        | 15.50      | 70                        | 0.270     | 1440                      | 390                        | 73.5                        | 6.2        |
|                                                                                  |                                                                                                                        | 16.00      | 70                        | 0.280     | 1395                      | 390                        | 78.5                        | 6.2        |
|                                                                                  | Aciers<br>1300 - 1500 N/mm <sup>2</sup>                                                                                | 10.00      | 40                        | 0.145     | 1275                      | 185                        | 14.5                        | 10.2       |
|                                                                                  |                                                                                                                        | 10.20      | 40                        | 0.145     | 1250                      | 180                        | 14.5                        | 12.4       |
|                                                                                  |                                                                                                                        | 11.00      | 40                        | 0.155     | 1155                      | 180                        | 17.0                        | 12.2       |
|                                                                                  |                                                                                                                        | 12.00      | 40                        | 0.170     | 1060                      | 180                        | 20.5                        | 12.1       |
|                                                                                  |                                                                                                                        | 13.00      | 40                        | 0.185     | 980                       | 180                        | 24.0                        | 12.9       |
|                                                                                  |                                                                                                                        | 14.00      | 40                        | 0.200     | 910                       | 180                        | 27.5                        | 12.8       |
|                                                                                  |                                                                                                                        | 15.00      | 40                        | 0.215     | 850                       | 185                        | 32.5                        | 13.2       |
|                                                                                  |                                                                                                                        | 15.50      | 40                        | 0.220     | 820                       | 180                        | 34.0                        | 13.5       |
|                                                                                  |                                                                                                                        | 16.00      | 40                        | 0.230     | 795                       | 185                        | 37.0                        | 13.1       |
|                                                                                  | Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 10.00      | 60                        | 0.150     | 1910                      | 285                        | 22.5                        | 6.6        |
|                                                                                  |                                                                                                                        | 10.20      | 60                        | 0.150     | 1870                      | 280                        | 23.0                        | 8.0        |
|                                                                                  |                                                                                                                        | 11.00      | 60                        | 0.165     | 1735                      | 285                        | 27.0                        | 7.7        |
|                                                                                  |                                                                                                                        | 12.00      | 60                        | 0.180     | 1590                      | 285                        | 32.0                        | 7.7        |
|                                                                                  |                                                                                                                        | 13.00      | 60                        | 0.195     | 1470                      | 285                        | 38.0                        | 8.1        |
|                                                                                  |                                                                                                                        | 14.00      | 60                        | 0.210     | 1365                      | 285                        | 44.0                        | 8.1        |
|                                                                                  |                                                                                                                        | 15.00      | 60                        | 0.225     | 1275                      | 285                        | 50.5                        | 8.6        |
|                                                                                  |                                                                                                                        | 15.50      | 60                        | 0.230     | 1230                      | 285                        | 54.0                        | 8.5        |
|                                                                                  |                                                                                                                        | 16.00      | 60                        | 0.240     | 1195                      | 285                        | 57.5                        | 8.5        |
|                                                                                  | Fonte<br>grise / sphéroïdale                                                                                           | 10.00      | 220                       | 0.315     | 7005                      | 2205                       | 173.0                       | 0.9        |
|                                                                                  |                                                                                                                        | 10.20      | 220                       | 0.320     | 6865                      | 2195                       | 179.5                       | 1.0        |
|                                                                                  |                                                                                                                        | 11.00      | 220                       | 0.345     | 6365                      | 2195                       | 208.5                       | 1.0        |
|                                                                                  |                                                                                                                        | 12.00      | 220                       | 0.375     | 5835                      | 2190                       | 247.5                       | 1.0        |
|                                                                                  |                                                                                                                        | 13.00      | 220                       | 0.405     | 5385                      | 2180                       | 289.5                       | 1.1        |
|                                                                                  |                                                                                                                        | 14.00      | 220                       | 0.440     | 5000                      | 2200                       | 338.5                       | 1.0        |
|                                                                                  |                                                                                                                        | 15.00      | 220                       | 0.470     | 4670                      | 2195                       | 388.0                       | 1.1        |
|                                                                                  |                                                                                                                        | 15.50      | 220                       | 0.485     | 4520                      | 2190                       | 413.0                       | 1.1        |
|                                                                                  |                                                                                                                        | 16.00      | 220                       | 0.500     | 4375                      | 2190                       | 440.5                       | 1.1        |
|                                                                                  | Aluminium corroyé<br>Si < 6%                                                                                           | 10.00      | 250                       | 0.285     | 7960                      | 2270                       | 178.5                       | 0.8        |
|                                                                                  |                                                                                                                        | 10.20      | 250                       | 0.290     | 7800                      | 2260                       | 184.5                       | 1.0        |
|                                                                                  |                                                                                                                        | 11.00      | 250                       | 0.315     | 7235                      | 2280                       | 216.5                       | 1.0        |
|                                                                                  |                                                                                                                        | 12.00      | 250                       | 0.345     | 6630                      | 2285                       | 258.5                       | 1.0        |
|                                                                                  |                                                                                                                        | 13.00      | 250                       | 0.370     | 6120                      | 2265                       | 300.5                       | 1.0        |
|                                                                                  |                                                                                                                        | 14.00      | 250                       | 0.400     | 5685                      | 2275                       | 350.0                       | 1.0        |
|                                                                                  |                                                                                                                        | 15.00      | 250                       | 0.430     | 5305                      | 2280                       | 403.0                       | 1.1        |
|                                                                                  |                                                                                                                        | 15.50      | 250                       | 0.445     | 5135                      | 2285                       | 431.0                       | 1.1        |
|                                                                                  |                                                                                                                        | 16.00      | 250                       | 0.455     | 4975                      | 2265                       | 455.5                       | 1.1        |

# Forets hélicoïdaux Supradrill® U

3xd

HM  
MG10



Rm  
< 850

Rm  
850-1100

Rm  
1100-1300

Rm  
1300-1500

Inox  
Stainless

GG(G)  
Aluminium

|                    |          |          |     |    |    |                  | NANO-U <sup>2</sup> |   |
|--------------------|----------|----------|-----|----|----|------------------|---------------------|---|
| Exemple:<br>N° cde |          |          |     |    |    |                  | B62011              |   |
|                    |          |          |     |    |    |                  | B63011              |   |
| Ø<br>Code          | d1<br>m7 | d2<br>h6 | l1  | l2 | l4 | L <sub>max</sub> |                     |   |
| .0950              | 9.5      | 10       | 89  | 47 | 40 | 31.5             |                     | ● |
| .0980              | 9.8      | 10       | 89  | 47 | 40 | 31.4             |                     | ● |
| .1000              | 10.0     | 10       | 89  | 47 | 40 | 31.5             |                     | ● |
| .1020              | 10.2     | 12       | 102 | 55 | 45 | 37.2             |                     | ● |
| .1050              | 10.5     | 12       | 102 | 55 | 45 | 37.1             |                     | ● |
| .1080              | 10.8     | 12       | 102 | 55 | 45 | 36.9             |                     | ● |
| .1100              | 11.0     | 12       | 102 | 55 | 45 | 36.7             |                     | ● |
| .1150              | 11.5     | 12       | 102 | 55 | 45 | 36.5             |                     | ● |
| .1180              | 11.8     | 12       | 102 | 55 | 45 | 36.3             |                     | ● |
| .1200              | 12.0     | 12       | 102 | 55 | 45 | 36.4             |                     | ● |
| .1250              | 12.5     | 14       | 107 | 60 | 45 | 39.1             |                     | ● |
| .1280              | 12.8     | 14       | 107 | 60 | 45 | 38.9             |                     | ● |
| .1300              | 13.0     | 14       | 107 | 60 | 45 | 38.7             |                     | ● |
| .1350              | 13.5     | 14       | 107 | 60 | 45 | 38.5             |                     | ● |
| .1380              | 13.8     | 14       | 107 | 60 | 45 | 38.3             |                     | ● |
| .1400              | 14.0     | 14       | 107 | 60 | 45 | 38.4             |                     | ● |
| .1450              | 14.5     | 16       | 115 | 65 | 48 | 41.1             |                     | ● |
| .1480              | 14.8     | 16       | 115 | 65 | 48 | 40.8             |                     | ● |
| .1500              | 15.0     | 16       | 115 | 65 | 48 | 40.7             |                     | ● |
| .1550              | 15.5     | 16       | 115 | 65 | 48 | 40.5             |                     | ● |
| .1580              | 15.8     | 16       | 115 | 65 | 48 | 40.3             |                     | ● |
| .1600              | 16.0     | 16       | 115 | 65 | 48 | 40.4             |                     | ● |

## Application



## Matières

Aciers  
< 500 N/mm<sup>2</sup>

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 3.00       | 150                       | 0.080     | 15915                     | 1275                       | 9.0                         | 1.3        |
| 3.30       | 150                       | 0.090     | 14470                     | 1300                       | 11.0                        | 1.2        |
| 3.50       | 150                       | 0.095     | 13640                     | 1295                       | 12.5                        | 1.2        |
| 3.80       | 150                       | 0.105     | 12565                     | 1320                       | 15.0                        | 1.6        |
| 4.00       | 150                       | 0.110     | 11935                     | 1315                       | 16.5                        | 1.6        |
| 4.20       | 150                       | 0.120     | 11370                     | 1365                       | 19.0                        | 1.5        |
| 4.50       | 150                       | 0.140     | 10610                     | 1485                       | 23.5                        | 1.4        |
| 4.80       | 150                       | 0.145     | 9945                      | 1440                       | 26.0                        | 2.0        |
| 5.00       | 150                       | 0.155     | 9550                      | 1480                       | 29.0                        | 1.9        |

Aciers  
500 - 850 N/mm<sup>2</sup>

|      |     |       |       |      |      |     |
|------|-----|-------|-------|------|------|-----|
| 3.00 | 120 | 0.070 | 12730 | 890  | 6.5  | 1.8 |
| 3.30 | 120 | 0.075 | 11575 | 870  | 7.5  | 1.9 |
| 3.50 | 120 | 0.080 | 10915 | 875  | 8.5  | 1.8 |
| 3.80 | 120 | 0.090 | 10050 | 905  | 10.5 | 2.3 |
| 4.00 | 120 | 0.095 | 9550  | 905  | 11.5 | 2.3 |
| 4.20 | 120 | 0.105 | 9095  | 955  | 13.0 | 2.2 |
| 4.50 | 120 | 0.120 | 8490  | 1020 | 16.0 | 2.0 |
| 4.80 | 120 | 0.125 | 7960  | 995  | 18.0 | 2.9 |
| 5.00 | 120 | 0.130 | 7640  | 995  | 19.5 | 2.9 |

Aciers  
850 - 1100 N/mm<sup>2</sup>

|      |     |       |       |     |      |     |
|------|-----|-------|-------|-----|------|-----|
| 3.00 | 100 | 0.065 | 10610 | 690 | 5.0  | 2.4 |
| 3.30 | 100 | 0.070 | 9645  | 675 | 6.0  | 2.4 |
| 3.50 | 100 | 0.075 | 9095  | 680 | 6.5  | 2.4 |
| 3.80 | 100 | 0.080 | 8375  | 670 | 7.5  | 3.2 |
| 4.00 | 100 | 0.090 | 7960  | 715 | 9.0  | 2.9 |
| 4.20 | 100 | 0.095 | 7580  | 720 | 10.0 | 2.9 |
| 4.50 | 100 | 0.110 | 7075  | 780 | 12.5 | 2.7 |
| 4.80 | 100 | 0.115 | 6630  | 760 | 14.0 | 3.7 |
| 5.00 | 100 | 0.120 | 6365  | 765 | 15.0 | 3.7 |

Aciers  
1100 - 1300 N/mm<sup>2</sup>

|      |    |       |      |     |     |     |
|------|----|-------|------|-----|-----|-----|
| 3.00 | 70 | 0.050 | 7425 | 370 | 2.5 | 4.4 |
| 3.30 | 70 | 0.055 | 6750 | 370 | 3.0 | 4.4 |
| 3.50 | 70 | 0.055 | 6365 | 350 | 3.5 | 4.6 |
| 3.80 | 70 | 0.060 | 5865 | 350 | 4.0 | 6.1 |
| 4.00 | 70 | 0.065 | 5570 | 360 | 4.5 | 5.8 |
| 4.20 | 70 | 0.070 | 5305 | 370 | 5.0 | 5.6 |
| 4.50 | 70 | 0.085 | 4950 | 420 | 6.5 | 4.9 |
| 4.80 | 70 | 0.090 | 4640 | 420 | 7.5 | 6.8 |
| 5.00 | 70 | 0.090 | 4455 | 400 | 8.0 | 7.2 |

## Matières

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|      |    |       |      |     |     |      |
|------|----|-------|------|-----|-----|------|
| 3.00 | 40 | 0.035 | 4245 | 150 | 1.0 | 10.9 |
| 3.30 | 40 | 0.040 | 3860 | 155 | 1.5 | 10.4 |
| 3.50 | 40 | 0.045 | 3640 | 165 | 1.5 | 9.7  |
| 3.80 | 40 | 0.045 | 3350 | 150 | 1.5 | 14.2 |
| 4.00 | 40 | 0.050 | 3185 | 160 | 2.0 | 13.1 |
| 4.20 | 40 | 0.055 | 3030 | 165 | 2.5 | 12.7 |
| 4.50 | 40 | 0.065 | 2830 | 185 | 3.0 | 11.2 |
| 4.80 | 40 | 0.070 | 2655 | 185 | 3.5 | 15.4 |
| 5.00 | 40 | 0.070 | 2545 | 180 | 3.5 | 15.9 |

Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]  
Aciers inoxydables  
[Cr-Ni/1.4301]

|      |    |       |      |     |     |      |
|------|----|-------|------|-----|-----|------|
| 3.00 | 60 | 0.035 | 6365 | 225 | 1.5 | 7.3  |
| 3.30 | 60 | 0.040 | 5785 | 230 | 2.0 | 7.0  |
| 3.50 | 60 | 0.045 | 5455 | 245 | 2.5 | 6.6  |
| 3.80 | 60 | 0.045 | 5025 | 225 | 2.5 | 9.4  |
| 4.00 | 60 | 0.050 | 4775 | 240 | 3.0 | 8.7  |
| 4.20 | 60 | 0.055 | 4545 | 250 | 3.5 | 8.4  |
| 4.50 | 60 | 0.065 | 4245 | 275 | 4.5 | 7.5  |
| 4.80 | 60 | 0.070 | 3980 | 280 | 5.0 | 10.2 |
| 5.00 | 60 | 0.070 | 3820 | 265 | 5.0 | 10.8 |

Titanes alliés trempés  
>300 HB  
[Ti6Al4V]

|      |    |       |      |     |     |      |
|------|----|-------|------|-----|-----|------|
| 3.00 | 35 | 0.035 | 3715 | 130 | 1.0 | 12.6 |
| 3.30 | 35 | 0.040 | 3375 | 135 | 1.0 | 12.0 |
| 3.50 | 35 | 0.045 | 3185 | 145 | 1.5 | 11.1 |
| 3.80 | 35 | 0.045 | 2930 | 130 | 1.5 | 16.3 |
| 4.00 | 35 | 0.050 | 2785 | 140 | 2.0 | 15.0 |
| 4.20 | 35 | 0.055 | 2655 | 145 | 2.0 | 14.4 |
| 4.50 | 35 | 0.065 | 2475 | 160 | 2.5 | 13.0 |
| 4.80 | 35 | 0.070 | 2320 | 160 | 3.0 | 17.8 |
| 5.00 | 35 | 0.070 | 2230 | 155 | 3.0 | 18.5 |

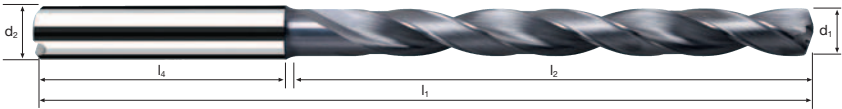
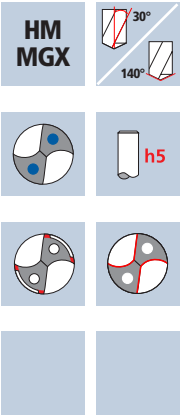
Fonte  
grise / sphéroïdale

|      |     |       |       |      |      |     |
|------|-----|-------|-------|------|------|-----|
| 3.00 | 220 | 0.075 | 23345 | 1750 | 12.5 | 0.9 |
| 3.30 | 220 | 0.080 | 21220 | 1700 | 14.5 | 1.0 |
| 3.50 | 220 | 0.085 | 20010 | 1700 | 16.5 | 0.9 |
| 3.80 | 220 | 0.095 | 18430 | 1750 | 20.0 | 1.2 |
| 4.00 | 220 | 0.100 | 17505 | 1750 | 22.0 | 1.2 |
| 4.20 | 220 | 0.110 | 16675 | 1835 | 25.5 | 1.1 |
| 4.50 | 220 | 0.125 | 15560 | 1945 | 31.0 | 1.1 |
| 4.80 | 220 | 0.135 | 14590 | 1970 | 35.5 | 1.4 |
| 5.00 | 220 | 0.140 | 14005 | 1960 | 38.5 | 1.5 |



# Forets hélicoïdaux XDrill®

8xd



|             |                |                 |                 |  |  |  |                   |                |       |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|----------------|-------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|----------------|-------|

| Exemple: N° cde     |          |          |    |    |    |                  | DURO-X |   |
|---------------------|----------|----------|----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |    |    |    |                  | B72020 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1 | l2 | l4 | L <sub>max</sub> |        |   |
| .0300               | 3.0      | 6        | 73 | 34 | 36 | 27.2             |        | ● |
| .0310               | 3.1      | 6        | 73 | 34 | 36 | 27.2             |        | ● |
| .0320               | 3.2      | 6        | 73 | 34 | 36 | 27.0             |        | ● |
| .0330               | 3.3      | 6        | 73 | 34 | 36 | 27.0             |        | ● |
| .0340               | 3.4      | 6        | 73 | 34 | 36 | 26.8             |        | ● |
| .0350               | 3.5      | 6        | 73 | 34 | 36 | 26.8             |        | ● |
| .0360               | 3.6      | 6        | 73 | 34 | 36 | 26.6             |        | ● |
| .0370               | 3.7      | 6        | 73 | 34 | 36 | 26.6             |        | ● |
| .0380               | 3.8      | 6        | 82 | 43 | 36 | 35.4             |        | ● |
| .0390               | 3.9      | 6        | 82 | 43 | 36 | 35.4             |        | ● |
| .0400               | 4.0      | 6        | 82 | 43 | 36 | 34.9             |        | ● |
| .0410               | 4.1      | 6        | 82 | 43 | 36 | 34.9             |        | ● |
| .0420               | 4.2      | 6        | 82 | 43 | 36 | 34.8             |        | ● |
| .0430               | 4.3      | 6        | 82 | 43 | 36 | 34.7             |        | ● |
| .0440               | 4.4      | 6        | 82 | 43 | 36 | 34.6             |        | ● |
| .0450               | 4.5      | 6        | 82 | 43 | 36 | 34.6             |        | ● |
| .0460               | 4.6      | 6        | 82 | 43 | 36 | 34.5             |        | ● |
| .0470               | 4.7      | 6        | 82 | 43 | 36 | 34.5             |        | ● |
| .0480               | 4.8      | 6        | 95 | 56 | 36 | 47.4             |        | ● |
| .0490               | 4.9      | 6        | 95 | 56 | 36 | 47.3             |        | ● |
| .0500               | 5.0      | 6        | 95 | 56 | 36 | 47.7             |        | ● |
| .0510               | 5.1      | 6        | 95 | 56 | 36 | 47.7             |        | ● |
| .0520               | 5.2      | 6        | 95 | 56 | 36 | 47.6             |        | ● |

## Application



## Matières

Aciers  
< 500 N/mm²

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm³/min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|----------------|------------|
| 5.50       | 150                       | 0.170     | 8680                      | 1475                       | 35.0           | 1.9        |
| 5.80       | 150                       | 0.180     | 8230                      | 1480                       | 39.0           | 1.9        |
| 6.00       | 150                       | 0.190     | 7960                      | 1510                       | 42.5           | 1.9        |
| 6.20       | 150                       | 0.205     | 7700                      | 1580                       | 47.5           | 2.1        |
| 6.50       | 150                       | 0.210     | 7345                      | 1540                       | 51.0           | 2.1        |
| 6.80       | 150                       | 0.220     | 7020                      | 1545                       | 56.0           | 2.1        |
| 7.00       | 150                       | 0.230     | 6820                      | 1570                       | 60.5           | 2.1        |
| 7.20       | 150                       | 0.235     | 6630                      | 1560                       | 63.5           | 2.5        |
| 7.50       | 150                       | 0.245     | 6365                      | 1560                       | 69.0           | 2.5        |

Aciers  
500 - 850 N/mm²

|      |     |       |      |      |      |     |
|------|-----|-------|------|------|------|-----|
| 5.50 | 120 | 0.145 | 6945 | 1005 | 24.0 | 2.8 |
| 5.80 | 120 | 0.150 | 6585 | 990  | 26.0 | 2.9 |
| 6.00 | 120 | 0.165 | 6365 | 1050 | 29.5 | 2.7 |
| 6.20 | 120 | 0.175 | 6160 | 1080 | 32.5 | 3.1 |
| 6.50 | 120 | 0.180 | 5875 | 1060 | 35.0 | 3.1 |
| 6.80 | 120 | 0.190 | 5615 | 1065 | 38.5 | 3.1 |
| 7.00 | 120 | 0.195 | 5455 | 1065 | 41.0 | 3.1 |
| 7.20 | 120 | 0.200 | 5305 | 1060 | 43.0 | 3.7 |
| 7.50 | 120 | 0.210 | 5095 | 1070 | 47.5 | 3.6 |

Aciers  
850 - 1100 N/mm²

|      |     |       |      |     |      |     |
|------|-----|-------|------|-----|------|-----|
| 5.50 | 100 | 0.135 | 5785 | 780 | 18.5 | 3.7 |
| 5.80 | 100 | 0.140 | 5490 | 770 | 20.5 | 3.7 |
| 6.00 | 100 | 0.150 | 5305 | 795 | 22.5 | 3.6 |
| 6.20 | 100 | 0.160 | 5135 | 820 | 25.0 | 4.0 |
| 6.50 | 100 | 0.170 | 4895 | 830 | 27.5 | 4.0 |
| 6.80 | 100 | 0.175 | 4680 | 820 | 30.0 | 4.0 |
| 7.00 | 100 | 0.180 | 4545 | 820 | 31.5 | 4.0 |
| 7.20 | 100 | 0.185 | 4420 | 820 | 33.5 | 4.7 |
| 7.50 | 100 | 0.195 | 4245 | 830 | 36.5 | 4.7 |

Aciers  
1100 - 1300 N/mm²

|      |    |       |      |     |      |     |
|------|----|-------|------|-----|------|-----|
| 5.50 | 70 | 0.100 | 4050 | 405 | 9.5  | 7.0 |
| 5.80 | 70 | 0.105 | 3840 | 405 | 10.5 | 7.0 |
| 6.00 | 70 | 0.115 | 3715 | 425 | 12.0 | 6.7 |
| 6.20 | 70 | 0.120 | 3595 | 430 | 13.0 | 7.7 |
| 6.50 | 70 | 0.125 | 3430 | 430 | 14.5 | 7.7 |
| 6.80 | 70 | 0.135 | 3275 | 440 | 16.0 | 7.5 |
| 7.00 | 70 | 0.135 | 3185 | 430 | 16.5 | 7.6 |
| 7.20 | 70 | 0.140 | 3095 | 435 | 17.5 | 8.9 |
| 7.50 | 70 | 0.145 | 2970 | 430 | 19.0 | 9.0 |

## Matières

Aciers  
1300 - 1500 N/mm²

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm³/min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|----------------|------------|
| 5.50       | 40                        | 0.080     | 2315                      | 185                        | 4.5            | 15.4       |
| 5.80       | 40                        | 0.080     | 2195                      | 175                        | 4.5            | 16.2       |
| 6.00       | 40                        | 0.090     | 2120                      | 190                        | 5.5            | 14.9       |
| 6.20       | 40                        | 0.095     | 2055                      | 195                        | 6.0            | 17.0       |
| 6.50       | 40                        | 0.100     | 1960                      | 195                        | 6.5            | 16.9       |
| 6.80       | 40                        | 0.105     | 1870                      | 195                        | 7.0            | 16.9       |
| 7.00       | 40                        | 0.105     | 1820                      | 190                        | 7.5            | 17.3       |
| 7.20       | 40                        | 0.110     | 1770                      | 195                        | 8.0            | 19.9       |
| 7.50       | 40                        | 0.115     | 1700                      | 195                        | 8.5            | 19.8       |

Aciers à outil pour  
travail à froid (12% Cr)  
fortement allié  
[1.2379]  
Aciers inoxydables  
[Cr-Ni/1.4301]

|      |    |       |      |     |      |      |
|------|----|-------|------|-----|------|------|
| 5.50 | 60 | 0.080 | 3470 | 280 | 6.5  | 10.2 |
| 5.80 | 60 | 0.080 | 3295 | 265 | 7.0  | 10.7 |
| 6.00 | 60 | 0.090 | 3185 | 285 | 8.0  | 9.9  |
| 6.20 | 60 | 0.095 | 3080 | 295 | 9.0  | 11.2 |
| 6.50 | 60 | 0.100 | 2940 | 295 | 10.0 | 11.2 |
| 6.80 | 60 | 0.105 | 2810 | 295 | 10.5 | 11.1 |
| 7.00 | 60 | 0.105 | 2730 | 285 | 11.0 | 11.5 |
| 7.20 | 60 | 0.110 | 2655 | 290 | 12.0 | 13.4 |
| 7.50 | 60 | 0.115 | 2545 | 295 | 13.0 | 13.1 |

Titanes alliés trempés  
>300 HB  
[Ti6Al4V]

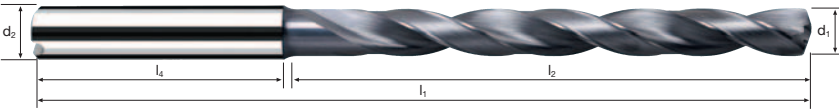
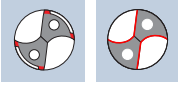
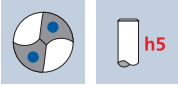
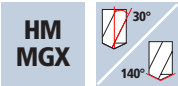
|      |    |       |      |     |     |      |
|------|----|-------|------|-----|-----|------|
| 5.50 | 35 | 0.080 | 2025 | 160 | 4.0 | 17.8 |
| 5.80 | 35 | 0.080 | 1920 | 155 | 4.0 | 18.3 |
| 6.00 | 35 | 0.090 | 1855 | 165 | 4.5 | 17.2 |
| 6.20 | 35 | 0.095 | 1795 | 170 | 5.0 | 19.5 |
| 6.50 | 35 | 0.100 | 1715 | 170 | 5.5 | 19.4 |
| 6.80 | 35 | 0.105 | 1640 | 170 | 6.0 | 19.3 |
| 7.00 | 35 | 0.105 | 1590 | 165 | 6.5 | 19.9 |
| 7.20 | 35 | 0.110 | 1545 | 170 | 7.0 | 22.8 |
| 7.50 | 35 | 0.115 | 1485 | 170 | 7.5 | 22.7 |

Fonte  
grise / sphéroïdale

|      |     |       |       |      |      |     |
|------|-----|-------|-------|------|------|-----|
| 5.50 | 220 | 0.155 | 12730 | 1975 | 47.0 | 1.4 |
| 5.80 | 220 | 0.160 | 12075 | 1930 | 51.0 | 1.5 |
| 6.00 | 220 | 0.175 | 11670 | 2040 | 57.5 | 1.4 |
| 6.20 | 220 | 0.185 | 11295 | 2090 | 63.0 | 1.6 |
| 6.50 | 220 | 0.195 | 10775 | 2100 | 69.5 | 1.6 |
| 6.80 | 220 | 0.200 | 10300 | 2060 | 75.0 | 1.6 |
| 7.00 | 220 | 0.210 | 10005 | 2100 | 81.0 | 1.6 |
| 7.20 | 220 | 0.215 | 9725  | 2090 | 85.0 | 1.9 |
| 7.50 | 220 | 0.225 | 9335  | 2100 | 93.0 | 1.8 |

# Forets hélicoïdaux XDrill®

8xd



|             |                |                 |                 |  |  |  |                   |                |       |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|----------------|-------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|----------------|-------|

| Exemple: N° cde     |          |          |     |    |    |                  | DURO-X |   |
|---------------------|----------|----------|-----|----|----|------------------|--------|---|
| N° d'article Code-ø |          |          |     |    |    |                  | B72020 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1  | l2 | l4 | L <sub>max</sub> |        |   |
| .0530               | 5.3      | 6        | 95  | 56 | 36 | 47.6             |        | ● |
| .0540               | 5.4      | 6        | 95  | 56 | 36 | 47.5             |        | ● |
| .0550               | 5.5      | 6        | 95  | 56 | 36 | 47.5             |        | ● |
| .0560               | 5.6      | 6        | 95  | 56 | 36 | 47.4             |        | ● |
| .0570               | 5.7      | 6        | 95  | 56 | 36 | 47.4             |        | ● |
| .0580               | 5.8      | 6        | 95  | 56 | 36 | 47.3             |        | ● |
| .0590               | 5.9      | 6        | 95  | 56 | 36 | 47.4             |        | ● |
| .0600               | 6.0      | 6        | 95  | 56 | 36 | 47.2             |        | ● |
| .0610               | 6.1      | 8        | 105 | 66 | 36 | 55.3             |        | ● |
| .0620               | 6.2      | 8        | 105 | 66 | 36 | 55.2             |        | ● |
| .0630               | 6.3      | 8        | 105 | 66 | 36 | 55.2             |        | ● |
| .0640               | 6.4      | 8        | 105 | 66 | 36 | 55.1             |        | ● |
| .0650               | 6.5      | 8        | 105 | 66 | 36 | 55.1             |        | ● |
| .0660               | 6.6      | 8        | 105 | 66 | 36 | 55.0             |        | ● |
| .0670               | 6.7      | 8        | 105 | 66 | 36 | 55.0             |        | ● |
| .0680               | 6.8      | 8        | 105 | 66 | 36 | 54.8             |        | ● |
| .0690               | 6.9      | 8        | 105 | 66 | 36 | 54.8             |        | ● |
| .0700               | 7.0      | 8        | 105 | 66 | 36 | 54.7             |        | ● |
| .0710               | 7.1      | 8        | 115 | 76 | 36 | 64.7             |        | ● |
| .0720               | 7.2      | 8        | 115 | 76 | 36 | 64.6             |        | ● |
| .0730               | 7.3      | 8        | 115 | 76 | 36 | 64.6             |        | ● |
| .0740               | 7.4      | 8        | 115 | 76 | 36 | 64.4             |        | ● |
| .0750               | 7.5      | 8        | 115 | 76 | 36 | 64.4             |        | ● |



| Application                       |
|-----------------------------------|
| Aciers<br>< 500 N/mm <sup>2</sup> |

|                                       |
|---------------------------------------|
| Aciers<br>500 - 850 N/mm <sup>2</sup> |
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|                                        |
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| Aciers<br>850 - 1100 N/mm <sup>2</sup> |
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|                                         |
|-----------------------------------------|
| Aciers<br>1100 - 1300 N/mm <sup>2</sup> |
|-----------------------------------------|

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 7.60       | 150                       | 0.250     | 6280                      | 1570                       | 71.0                        | 2.5        |
| 8.00       | 150                       | 0.260     | 5970                      | 1550                       | 78.0                        | 2.5        |
| 8.20       | 150                       | 0.270     | 5825                      | 1575                       | 83.0                        | 2.8        |
| 8.50       | 150                       | 0.280     | 5615                      | 1570                       | 89.0                        | 2.7        |
| 8.80       | 150                       | 0.285     | 5425                      | 1545                       | 94.0                        | 2.8        |
| 9.00       | 150                       | 0.295     | 5305                      | 1565                       | 99.5                        | 2.7        |
| 9.20       | 150                       | 0.300     | 5190                      | 1555                       | 103.5                       | 3.1        |
| 9.50       | 150                       | 0.310     | 5025                      | 1560                       | 110.5                       | 3.1        |
| 9.80       | 150                       | 0.320     | 4870                      | 1560                       | 117.5                       | 3.1        |
| 7.60       | 120                       | 0.215     | 5025                      | 1080                       | 49.0                        | 3.6        |
| 8.00       | 120                       | 0.225     | 4775                      | 1075                       | 54.0                        | 3.6        |
| 8.20       | 120                       | 0.230     | 4660                      | 1070                       | 56.5                        | 4.0        |
| 8.50       | 120                       | 0.240     | 4495                      | 1080                       | 61.5                        | 4.0        |
| 8.80       | 120                       | 0.245     | 4340                      | 1065                       | 65.0                        | 4.0        |
| 9.00       | 120                       | 0.250     | 4245                      | 1060                       | 67.5                        | 4.1        |
| 9.20       | 120                       | 0.260     | 4150                      | 1080                       | 72.0                        | 4.5        |
| 9.50       | 120                       | 0.265     | 4020                      | 1065                       | 75.5                        | 4.5        |
| 9.80       | 120                       | 0.275     | 3900                      | 1075                       | 81.0                        | 4.5        |
| 7.60       | 100                       | 0.195     | 4190                      | 815                        | 37.0                        | 4.7        |
| 8.00       | 100                       | 0.205     | 3980                      | 815                        | 41.0                        | 4.7        |
| 8.20       | 100                       | 0.210     | 3880                      | 815                        | 43.0                        | 5.3        |
| 8.50       | 100                       | 0.220     | 3745                      | 825                        | 47.0                        | 5.2        |
| 8.80       | 100                       | 0.225     | 3615                      | 815                        | 49.5                        | 5.3        |
| 9.00       | 100                       | 0.230     | 3535                      | 815                        | 52.0                        | 5.3        |
| 9.20       | 100                       | 0.235     | 3460                      | 815                        | 54.0                        | 5.9        |
| 9.50       | 100                       | 0.245     | 3350                      | 820                        | 58.0                        | 5.9        |
| 9.80       | 100                       | 0.255     | 3250                      | 830                        | 62.5                        | 5.8        |
| 7.60       | 70                        | 0.150     | 2930                      | 440                        | 20.0                        | 8.8        |
| 8.00       | 70                        | 0.155     | 2785                      | 430                        | 21.5                        | 8.9        |
| 8.20       | 70                        | 0.160     | 2715                      | 435                        | 23.0                        | 10.0       |
| 8.50       | 70                        | 0.165     | 2620                      | 430                        | 24.5                        | 10.0       |
| 8.80       | 70                        | 0.170     | 2530                      | 430                        | 26.0                        | 10.0       |
| 9.00       | 70                        | 0.175     | 2475                      | 435                        | 27.5                        | 9.9        |
| 9.20       | 70                        | 0.180     | 2420                      | 435                        | 29.0                        | 11.1       |
| 9.50       | 70                        | 0.185     | 2345                      | 435                        | 31.0                        | 11.1       |
| 9.80       | 70                        | 0.190     | 2275                      | 430                        | 32.5                        | 11.2       |

| Matières |
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|                                         |
|-----------------------------------------|
| Aciers<br>1300 - 1500 N/mm <sup>2</sup> |
|-----------------------------------------|

|                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------|
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] |
|------------------------------------------------------------------------------------------------------------------------|

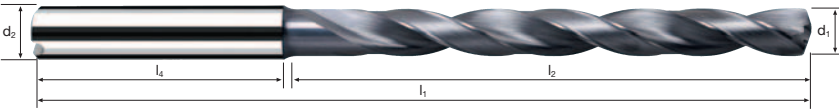
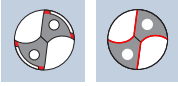
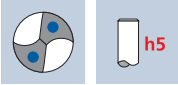
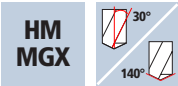
|                                                |
|------------------------------------------------|
| Titanes alliés trempés<br>>300 HB<br>[Ti6Al4V] |
|------------------------------------------------|

|                              |
|------------------------------|
| Fonte<br>grise / sphéroïdale |
|------------------------------|

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 7.60       | 40                        | 0.115     | 1675                      | 195                        | 9.0                         | 19.8       |
| 8.00       | 40                        | 0.120     | 1590                      | 190                        | 9.5                         | 20.2       |
| 8.20       | 40                        | 0.125     | 1555                      | 195                        | 10.5                        | 22.2       |
| 8.50       | 40                        | 0.130     | 1500                      | 195                        | 11.0                        | 22.1       |
| 8.80       | 40                        | 0.135     | 1445                      | 195                        | 12.0                        | 22.1       |
| 9.00       | 40                        | 0.135     | 1415                      | 190                        | 12.0                        | 22.6       |
| 9.20       | 40                        | 0.140     | 1385                      | 195                        | 13.0                        | 24.8       |
| 9.50       | 40                        | 0.145     | 1340                      | 195                        | 14.0                        | 24.7       |
| 9.80       | 40                        | 0.150     | 1300                      | 195                        | 14.5                        | 24.7       |
| 7.60       | 60                        | 0.115     | 2515                      | 290                        | 13.0                        | 13.3       |
| 8.00       | 60                        | 0.120     | 2385                      | 285                        | 14.5                        | 13.5       |
| 8.20       | 60                        | 0.125     | 2330                      | 290                        | 15.5                        | 14.9       |
| 8.50       | 60                        | 0.130     | 2245                      | 290                        | 16.5                        | 14.9       |
| 8.80       | 60                        | 0.135     | 2170                      | 295                        | 18.0                        | 14.6       |
| 9.00       | 60                        | 0.135     | 2120                      | 285                        | 18.0                        | 15.1       |
| 9.20       | 60                        | 0.140     | 2075                      | 290                        | 19.5                        | 16.7       |
| 9.50       | 60                        | 0.145     | 2010                      | 290                        | 20.5                        | 16.6       |
| 9.80       | 60                        | 0.150     | 1950                      | 295                        | 22.5                        | 16.3       |
| 7.60       | 35                        | 0.115     | 1465                      | 170                        | 7.5                         | 22.7       |
| 8.00       | 35                        | 0.120     | 1395                      | 165                        | 8.5                         | 23.3       |
| 8.20       | 35                        | 0.125     | 1360                      | 170                        | 9.0                         | 25.5       |
| 8.50       | 35                        | 0.130     | 1310                      | 170                        | 9.5                         | 25.4       |
| 8.80       | 35                        | 0.135     | 1265                      | 170                        | 10.5                        | 25.3       |
| 9.00       | 35                        | 0.135     | 1240                      | 165                        | 10.5                        | 26.1       |
| 9.20       | 35                        | 0.140     | 1210                      | 170                        | 11.5                        | 28.4       |
| 9.50       | 35                        | 0.145     | 1175                      | 170                        | 12.0                        | 28.4       |
| 9.80       | 35                        | 0.150     | 1135                      | 170                        | 13.0                        | 28.3       |
| 7.60       | 220                       | 0.225     | 9215                      | 2075                       | 94.0                        | 1.9        |
| 8.00       | 220                       | 0.240     | 8755                      | 2100                       | 105.5                       | 1.8        |
| 8.20       | 220                       | 0.245     | 8540                      | 2090                       | 110.5                       | 2.1        |
| 8.50       | 220                       | 0.250     | 8240                      | 2060                       | 117.0                       | 2.1        |
| 8.80       | 220                       | 0.260     | 7960                      | 2070                       | 126.0                       | 2.1        |
| 9.00       | 220                       | 0.265     | 7780                      | 2060                       | 131.0                       | 2.1        |
| 9.20       | 220                       | 0.275     | 7610                      | 2095                       | 139.5                       | 2.3        |
| 9.50       | 220                       | 0.280     | 7370                      | 2065                       | 146.5                       | 2.3        |
| 9.80       | 220                       | 0.290     | 7145                      | 2070                       | 156.0                       | 2.3        |

# Forets hélicoïdaux XDrill®

8xd



| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|----------------|-------|
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|----------------|-------|

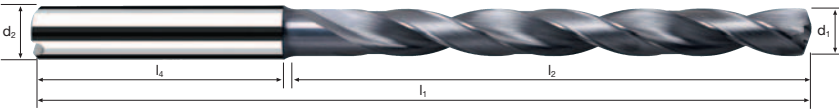
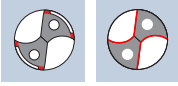
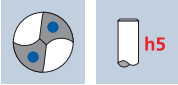
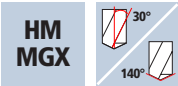
| Exemple:<br>N° cde |          |          |     |    |    |                  | DURO-X |   |
|--------------------|----------|----------|-----|----|----|------------------|--------|---|
| N° d'article       |          |          |     |    |    |                  | B72020 |   |
| Code-ø             |          |          |     |    |    |                  |        |   |
| ø<br>Code          | d1<br>m7 | d2<br>h5 | l1  | l2 | l4 | L <sub>max</sub> |        |   |
| .0760              | 7.6      | 8        | 115 | 76 | 36 | 64.3             |        | ● |
| .0770              | 7.7      | 8        | 115 | 76 | 36 | 64.4             |        | ● |
| .0780              | 7.8      | 8        | 115 | 76 | 36 | 64.3             |        | ● |
| .0790              | 7.9      | 8        | 115 | 76 | 36 | 64.3             |        | ● |
| .0800              | 8.0      | 8        | 115 | 76 | 36 | 64.1             |        | ● |
| .0810              | 8.1      | 10       | 129 | 86 | 40 | 72.3             |        | ● |
| .0820              | 8.2      | 10       | 129 | 86 | 40 | 72.2             |        | ● |
| .0830              | 8.3      | 10       | 129 | 86 | 40 | 72.2             |        | ● |
| .0840              | 8.4      | 10       | 129 | 86 | 40 | 72.1             |        | ● |
| .0850              | 8.5      | 10       | 129 | 86 | 40 | 72.0             |        | ● |
| .0860              | 8.6      | 10       | 129 | 86 | 40 | 71.9             |        | ● |
| .0870              | 8.7      | 10       | 129 | 86 | 40 | 71.9             |        | ● |
| .0880              | 8.8      | 10       | 129 | 86 | 40 | 71.8             |        | ● |
| .0890              | 8.9      | 10       | 129 | 86 | 40 | 71.8             |        | ● |
| .0900              | 9.0      | 10       | 129 | 86 | 40 | 71.7             |        | ● |
| .0910              | 9.1      | 10       | 138 | 95 | 40 | 80.7             |        | ● |
| .0920              | 9.2      | 10       | 138 | 95 | 40 | 80.5             |        | ● |
| .0930              | 9.3      | 10       | 138 | 95 | 40 | 80.5             |        | ● |
| .0940              | 9.4      | 10       | 138 | 95 | 40 | 80.4             |        | ● |
| .0950              | 9.5      | 10       | 138 | 95 | 40 | 80.4             |        | ● |
| .0960              | 9.6      | 10       | 138 | 95 | 40 | 80.3             |        | ● |
| .0970              | 9.7      | 10       | 138 | 95 | 40 | 80.3             |        | ● |
| .0980              | 9.8      | 10       | 138 | 95 | 40 | 80.2             |        | ● |

| Application                                                                       | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²       | 10.00      | 150                       | 0.325     | 4775                      | 1550                       | 121.5                       | 3.1        |
|                                                                                   |                             | 10.20      | 150                       | 0.335     | 4680                      | 1570                       | 128.5                       | 3.4        |
|                                                                                   |                             | 10.50      | 150                       | 0.345     | 4545                      | 1570                       | 136.0                       | 3.4        |
|                                                                                   |                             | 10.80      | 150                       | 0.350     | 4420                      | 1545                       | 141.5                       | 3.4        |
|                                                                                   |                             | 11.00      | 150                       | 0.355     | 4340                      | 1540                       | 146.5                       | 3.4        |
|                                                                                   |                             | 11.50      | 150                       | 0.360     | 4150                      | 1495                       | 155.5                       | 3.9        |
|                                                                                   |                             | 11.80      | 150                       | 0.360     | 4045                      | 1455                       | 159.0                       | 4.0        |
|                                                                                   |                             | 12.00      | 150                       | 0.370     | 3980                      | 1475                       | 167.0                       | 3.9        |
|                                                                                   |                             | 12.50      | 150                       | 0.385     | 3820                      | 1470                       | 180.5                       | 4.6        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm²   | 10.00      | 120                       | 0.280     | 3820                      | 1070                       | 84.0                        | 4.5        |
|                                                                                   |                             | 10.20      | 120                       | 0.285     | 3745                      | 1065                       | 87.0                        | 5.0        |
|                                                                                   |                             | 10.50      | 120                       | 0.295     | 3640                      | 1075                       | 93.0                        | 4.9        |
|                                                                                   |                             | 10.80      | 120                       | 0.300     | 3535                      | 1060                       | 97.0                        | 5.0        |
|                                                                                   |                             | 11.00      | 120                       | 0.305     | 3470                      | 1060                       | 100.5                       | 5.0        |
|                                                                                   |                             | 11.50      | 120                       | 0.310     | 3320                      | 1030                       | 107.0                       | 5.6        |
|                                                                                   |                             | 11.80      | 120                       | 0.310     | 3235                      | 1005                       | 110.0                       | 5.7        |
|                                                                                   |                             | 12.00      | 120                       | 0.315     | 3185                      | 1005                       | 113.5                       | 5.7        |
|                                                                                   |                             | 12.50      | 120                       | 0.330     | 3055                      | 1010                       | 124.0                       | 6.7        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | 10.00      | 100                       | 0.260     | 3185                      | 830                        | 65.0                        | 5.8        |
|                                                                                   |                             | 10.20      | 100                       | 0.265     | 3120                      | 825                        | 67.5                        | 6.4        |
|                                                                                   |                             | 10.50      | 100                       | 0.270     | 3030                      | 820                        | 71.0                        | 6.4        |
|                                                                                   |                             | 10.80      | 100                       | 0.275     | 2945                      | 810                        | 74.0                        | 6.5        |
|                                                                                   |                             | 11.00      | 100                       | 0.280     | 2895                      | 810                        | 77.0                        | 6.5        |
|                                                                                   |                             | 11.50      | 100                       | 0.285     | 2770                      | 790                        | 82.0                        | 7.3        |
|                                                                                   |                             | 11.80      | 100                       | 0.285     | 2700                      | 770                        | 84.0                        | 7.5        |
|                                                                                   |                             | 12.00      | 100                       | 0.290     | 2655                      | 770                        | 87.0                        | 7.5        |
|                                                                                   |                             | 12.50      | 100                       | 0.305     | 2545                      | 775                        | 95.0                        | 8.7        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm² | 10.00      | 70                        | 0.195     | 2230                      | 435                        | 34.0                        | 11.0       |
|                                                                                   |                             | 10.20      | 70                        | 0.200     | 2185                      | 435                        | 35.5                        | 12.2       |
|                                                                                   |                             | 10.50      | 70                        | 0.205     | 2120                      | 435                        | 37.5                        | 12.1       |
|                                                                                   |                             | 10.80      | 70                        | 0.210     | 2065                      | 435                        | 40.0                        | 12.1       |
|                                                                                   |                             | 11.00      | 70                        | 0.215     | 2025                      | 435                        | 41.5                        | 12.1       |
|                                                                                   |                             | 11.50      | 70                        | 0.215     | 1940                      | 415                        | 43.0                        | 13.9       |
|                                                                                   |                             | 11.80      | 70                        | 0.215     | 1890                      | 405                        | 44.5                        | 14.3       |
|                                                                                   |                             | 12.00      | 70                        | 0.220     | 1855                      | 410                        | 46.5                        | 14.0       |
|                                                                                   |                             | 12.50      | 70                        | 0.230     | 1785                      | 410                        | 50.5                        | 16.5       |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 10.00      | 40                        | 0.150     | 1275                      | 190                        | 15.0                        | 25.3       |
|                                                                                                                        | 10.20      | 40                        | 0.155     | 1250                      | 195                        | 16.0                        | 27.1       |
|                                                                                                                        | 10.50      | 40                        | 0.160     | 1215                      | 195                        | 17.0                        | 27.1       |
|                                                                                                                        | 10.80      | 40                        | 0.160     | 1180                      | 190                        | 17.5                        | 27.7       |
|                                                                                                                        | 11.00      | 40                        | 0.165     | 1155                      | 190                        | 18.0                        | 27.7       |
|                                                                                                                        | 11.50      | 40                        | 0.165     | 1105                      | 180                        | 18.5                        | 32.1       |
|                                                                                                                        | 11.80      | 40                        | 0.165     | 1080                      | 180                        | 19.5                        | 32.1       |
|                                                                                                                        | 12.00      | 40                        | 0.170     | 1060                      | 180                        | 20.5                        | 32.0       |
|                                                                                                                        | 12.50      | 40                        | 0.175     | 1020                      | 180                        | 22.0                        | 37.6       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 10.00      | 60                        | 0.150     | 1910                      | 285                        | 22.5                        | 16.8       |
|                                                                                                                        | 10.20      | 60                        | 0.155     | 1870                      | 290                        | 23.5                        | 18.2       |
|                                                                                                                        | 10.50      | 60                        | 0.160     | 1820                      | 290                        | 25.0                        | 18.2       |
|                                                                                                                        | 10.80      | 60                        | 0.160     | 1770                      | 285                        | 26.0                        | 18.5       |
|                                                                                                                        | 11.00      | 60                        | 0.165     | 1735                      | 285                        | 27.0                        | 18.4       |
|                                                                                                                        | 11.50      | 60                        | 0.165     | 1660                      | 275                        | 28.5                        | 21.0       |
|                                                                                                                        | 11.80      | 60                        | 0.165     | 1620                      | 265                        | 29.0                        | 21.8       |
|                                                                                                                        | 12.00      | 60                        | 0.170     | 1590                      | 270                        | 30.5                        | 21.3       |
|                                                                                                                        | 12.50      | 60                        | 0.175     | 1530                      | 270                        | 33.0                        | 25.1       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Titanes alliés trempés<br>>300 HB<br>[Ti6Al4V]                                                                         | 10.00      | 35                        | 0.150     | 1115                      | 165                        | 13.0                        | 29.1       |
|                                                                                                                        | 10.20      | 35                        | 0.155     | 1090                      | 170                        | 14.0                        | 31.1       |
|                                                                                                                        | 10.50      | 35                        | 0.160     | 1060                      | 170                        | 14.5                        | 31.0       |
|                                                                                                                        | 10.80      | 35                        | 0.160     | 1030                      | 165                        | 15.0                        | 31.9       |
|                                                                                                                        | 11.00      | 35                        | 0.165     | 1015                      | 165                        | 15.5                        | 31.9       |
|                                                                                                                        | 11.50      | 35                        | 0.165     | 970                       | 160                        | 16.5                        | 36.1       |
|                                                                                                                        | 11.80      | 35                        | 0.165     | 945                       | 155                        | 17.0                        | 37.2       |
|                                                                                                                        | 12.00      | 35                        | 0.170     | 930                       | 160                        | 18.0                        | 36.0       |
|                                                                                                                        | 12.50      | 35                        | 0.175     | 890                       | 155                        | 19.0                        | 43.7       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 10.00      | 220                       | 0.295     | 7005                      | 2065                       | 162.0                       | 2.3        |
|                                                                                                                        | 10.20      | 220                       | 0.305     | 6865                      | 2095                       | 171.0                       | 2.5        |
|                                                                                                                        | 10.50      | 220                       | 0.310     | 6670                      | 2070                       | 179.0                       | 2.5        |
|                                                                                                                        | 10.80      | 220                       | 0.315     | 6485                      | 2045                       | 187.5                       | 2.6        |
|                                                                                                                        | 11.00      | 220                       | 0.325     | 6365                      | 2070                       | 196.5                       | 2.5        |
|                                                                                                                        | 11.50      | 220                       | 0.330     | 6090                      | 2010                       | 209.0                       | 2.9        |
|                                                                                                                        | 11.80      | 220                       | 0.330     | 5935                      | 1960                       | 214.5                       | 2.9        |
|                                                                                                                        | 12.00      | 220                       | 0.335     | 5835                      | 1955                       | 221.0                       | 2.9        |
|                                                                                                                        | 12.50      | 220                       | 0.350     | 5600                      | 1960                       | 240.5                       | 3.5        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

# Forets hélicoïdaux XDrill®

8xd



| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  | Inox<br>Stainless | Ti<br>Titanium | GG(G) |
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|----------------|-------|
|-------------|----------------|-----------------|-----------------|--|--|--|-------------------|----------------|-------|

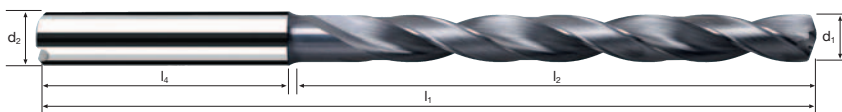
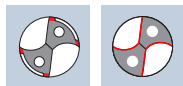
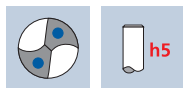
| Exemple: N° cde     |          |          |     |     |    |                  | DURO-X       |   |
|---------------------|----------|----------|-----|-----|----|------------------|--------------|---|
| N° d'article Code-ø |          |          |     |     |    |                  | B72020 .0990 |   |
| ø<br>Code           | d1<br>m7 | d2<br>h5 | l1  | l2  | l4 | L <sub>max</sub> |              |   |
| .0990               | 9.9      | 10       | 138 | 95  | 40 | 80.3             |              | ● |
| .1000               | 10.0     | 10       | 138 | 95  | 40 | 80.0             |              | ● |
| .1010               | 10.1     | 12       | 153 | 105 | 45 | 88.3             |              | ● |
| .1020               | 10.2     | 12       | 153 | 105 | 45 | 88.2             |              | ● |
| .1030               | 10.3     | 12       | 153 | 105 | 45 | 88.1             |              | ● |
| .1040               | 10.4     | 12       | 153 | 105 | 45 | 88.0             |              | ● |
| .1050               | 10.5     | 12       | 153 | 105 | 45 | 88.0             |              | ● |
| .1060               | 10.6     | 12       | 153 | 105 | 45 | 87.9             |              | ● |
| .1070               | 10.7     | 12       | 153 | 105 | 45 | 87.9             |              | ● |
| .1080               | 10.8     | 12       | 153 | 105 | 45 | 87.8             |              | ● |
| .1090               | 10.9     | 12       | 153 | 105 | 45 | 87.8             |              | ● |
| .1100               | 11.0     | 12       | 153 | 105 | 45 | 87.6             |              | ● |
| .1110               | 11.1     | 12       | 162 | 114 | 45 | 96.6             |              | ● |
| .1120               | 11.2     | 12       | 162 | 114 | 45 | 96.5             |              | ● |
| .1130               | 11.3     | 12       | 162 | 114 | 45 | 96.5             |              | ● |
| .1140               | 11.4     | 12       | 162 | 114 | 45 | 96.4             |              | ● |
| .1150               | 11.5     | 12       | 162 | 114 | 45 | 96.4             |              | ● |
| .1160               | 11.6     | 12       | 162 | 114 | 45 | 96.3             |              | ● |
| .1170               | 11.7     | 12       | 162 | 114 | 45 | 96.3             |              | ● |
| .1180               | 11.8     | 12       | 162 | 114 | 45 | 96.2             |              | ● |
| .1190               | 11.9     | 12       | 162 | 114 | 45 | 96.2             |              | ● |
| .1200               | 12.0     | 12       | 162 | 114 | 45 | 95.9             |              | ● |
| .1250               | 12.5     | 14       | 181 | 133 | 45 | 113.0            |              | ● |

| Application                                                                       | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²       | 12.80      | 150                       | 0.395     | 3730                      | 1475                       | 190.0                       | 4.6        |
|                                                                                   |                             | 13.00      | 150                       | 0.400     | 3675                      | 1470                       | 195.0                       | 4.6        |
|                                                                                   |                             | 13.50      | 150                       | 0.405     | 3615                      | 1465                       | 200.5                       | 4.6        |
|                                                                                   |                             | 14.00      | 150                       | 0.410     | 3410                      | 1400                       | 215.5                       | 4.8        |
|                                                                                   |                             | 14.50      | 150                       | 0.420     | 3295                      | 1385                       | 228.5                       | 5.6        |
|                                                                                   |                             | 14.80      | 150                       | 0.425     | 3225                      | 1370                       | 235.5                       | 5.6        |
|                                                                                   |                             | 15.00      | 150                       | 0.430     | 3185                      | 1370                       | 242.0                       | 5.6        |
|                                                                                   |                             | 15.50      | 150                       | 0.440     | 3080                      | 1355                       | 255.5                       | 5.7        |
|                                                                                   |                             | 16.00      | 150                       | 0.450     | 2985                      | 1345                       | 270.5                       | 5.7        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm²   | 12.80      | 120                       | 0.335     | 2985                      | 1000                       | 128.5                       | 6.8        |
|                                                                                   |                             | 13.00      | 120                       | 0.340     | 2940                      | 1000                       | 132.5                       | 6.8        |
|                                                                                   |                             | 13.50      | 120                       | 0.345     | 2895                      | 1000                       | 137.0                       | 6.7        |
|                                                                                   |                             | 14.00      | 120                       | 0.350     | 2730                      | 955                        | 147.0                       | 7.0        |
|                                                                                   |                             | 14.50      | 120                       | 0.360     | 2635                      | 950                        | 157.0                       | 8.1        |
|                                                                                   |                             | 14.80      | 120                       | 0.365     | 2580                      | 940                        | 161.5                       | 8.2        |
|                                                                                   |                             | 15.00      | 120                       | 0.370     | 2545                      | 940                        | 166.0                       | 8.2        |
|                                                                                   |                             | 15.50      | 120                       | 0.375     | 2465                      | 925                        | 174.5                       | 8.3        |
|                                                                                   |                             | 16.00      | 120                       | 0.385     | 2385                      | 920                        | 185.0                       | 8.3        |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | 12.80      | 100                       | 0.310     | 2485                      | 770                        | 99.0                        | 8.8        |
|                                                                                   |                             | 13.00      | 100                       | 0.315     | 2450                      | 770                        | 102.0                       | 8.8        |
|                                                                                   |                             | 13.50      | 100                       | 0.320     | 2410                      | 770                        | 105.5                       | 8.7        |
|                                                                                   |                             | 14.00      | 100                       | 0.325     | 2275                      | 740                        | 114.0                       | 9.1        |
|                                                                                   |                             | 14.50      | 100                       | 0.330     | 2195                      | 725                        | 119.5                       | 10.7       |
|                                                                                   |                             | 14.80      | 100                       | 0.335     | 2150                      | 720                        | 124.0                       | 10.7       |
|                                                                                   |                             | 15.00      | 100                       | 0.340     | 2120                      | 720                        | 127.0                       | 10.7       |
|                                                                                   |                             | 15.50      | 100                       | 0.345     | 2055                      | 710                        | 134.0                       | 10.8       |
|                                                                                   |                             | 16.00      | 100                       | 0.355     | 1990                      | 705                        | 141.5                       | 10.9       |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>1100 - 1300 N/mm² | 12.80      | 70                        | 0.235     | 1740                      | 410                        | 53.0                        | 16.5       |
|                                                                                   |                             | 13.00      | 70                        | 0.240     | 1715                      | 410                        | 54.5                        | 16.5       |
|                                                                                   |                             | 13.50      | 70                        | 0.245     | 1690                      | 415                        | 57.0                        | 16.2       |
|                                                                                   |                             | 14.00      | 70                        | 0.245     | 1590                      | 390                        | 60.0                        | 17.2       |
|                                                                                   |                             | 14.50      | 70                        | 0.250     | 1535                      | 385                        | 63.5                        | 20.1       |
|                                                                                   |                             | 14.80      | 70                        | 0.255     | 1505                      | 385                        | 66.0                        | 20.1       |
|                                                                                   |                             | 15.00      | 70                        | 0.260     | 1485                      | 385                        | 68.0                        | 20.0       |
|                                                                                   |                             | 15.50      | 70                        | 0.265     | 1440                      | 380                        | 71.5                        | 20.3       |
|                                                                                   |                             | 16.00      | 70                        | 0.270     | 1395                      | 375                        | 75.5                        | 20.4       |
|                                                                                   |                             |            |                           |           |                           |                            |                             |            |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 12.80      | 40                        | 0.180     | 995                       | 180                        | 23.0                        | 37.6       |
|                                                                                                                        | 13.00      | 40                        | 0.185     | 980                       | 180                        | 24.0                        | 37.5       |
|                                                                                                                        | 13.50      | 40                        | 0.185     | 965                       | 180                        | 24.5                        | 37.4       |
|                                                                                                                        | 14.00      | 40                        | 0.190     | 910                       | 175                        | 27.0                        | 38.4       |
|                                                                                                                        | 14.50      | 40                        | 0.195     | 880                       | 170                        | 28.0                        | 45.5       |
|                                                                                                                        | 14.80      | 40                        | 0.195     | 860                       | 170                        | 29.0                        | 45.4       |
|                                                                                                                        | 15.00      | 40                        | 0.200     | 850                       | 170                        | 30.0                        | 45.4       |
|                                                                                                                        | 15.50      | 40                        | 0.205     | 820                       | 170                        | 32.0                        | 45.3       |
|                                                                                                                        | 16.00      | 40                        | 0.205     | 795                       | 165                        | 33.0                        | 46.5       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 12.80      | 60                        | 0.180     | 1490                      | 270                        | 34.5                        | 25.0       |
|                                                                                                                        | 13.00      | 60                        | 0.185     | 1470                      | 270                        | 36.0                        | 25.0       |
|                                                                                                                        | 13.50      | 60                        | 0.185     | 1445                      | 265                        | 36.5                        | 25.4       |
|                                                                                                                        | 14.00      | 60                        | 0.190     | 1365                      | 260                        | 40.0                        | 25.8       |
|                                                                                                                        | 14.50      | 60                        | 0.195     | 1315                      | 255                        | 42.0                        | 30.3       |
|                                                                                                                        | 14.80      | 60                        | 0.195     | 1290                      | 250                        | 43.0                        | 30.9       |
|                                                                                                                        | 15.00      | 60                        | 0.200     | 1275                      | 255                        | 45.0                        | 30.3       |
|                                                                                                                        | 15.50      | 60                        | 0.205     | 1230                      | 250                        | 47.0                        | 30.8       |
|                                                                                                                        | 16.00      | 60                        | 0.205     | 1195                      | 245                        | 49.5                        | 31.3       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Titanes alliés trempés<br>>300 HB<br>[Ti6Al4V]                                                                         | 12.80      | 35                        | 0.180     | 870                       | 155                        | 20.0                        | 43.6       |
|                                                                                                                        | 13.00      | 35                        | 0.185     | 855                       | 160                        | 21.0                        | 42.2       |
|                                                                                                                        | 13.50      | 35                        | 0.185     | 845                       | 155                        | 21.0                        | 43.5       |
|                                                                                                                        | 14.00      | 35                        | 0.190     | 795                       | 150                        | 23.0                        | 44.8       |
|                                                                                                                        | 14.50      | 35                        | 0.195     | 770                       | 150                        | 25.0                        | 51.5       |
|                                                                                                                        | 14.80      | 35                        | 0.195     | 755                       | 145                        | 25.0                        | 53.3       |
|                                                                                                                        | 15.00      | 35                        | 0.200     | 745                       | 150                        | 26.5                        | 51.4       |
|                                                                                                                        | 15.50      | 35                        | 0.205     | 720                       | 150                        | 28.5                        | 51.3       |
|                                                                                                                        | 16.00      | 35                        | 0.205     | 695                       | 140                        | 28.0                        | 54.8       |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |
| Fonte<br>grise / sphéroïdale                                                                                           | 12.80      | 220                       | 0.355     | 5470                      | 1940                       | 249.5                       | 3.5        |
|                                                                                                                        | 13.00      | 220                       | 0.360     | 5385                      | 1940                       | 257.5                       | 3.5        |
|                                                                                                                        | 13.50      | 220                       | 0.370     | 5305                      | 1965                       | 269.0                       | 3.4        |
|                                                                                                                        | 14.00      | 220                       | 0.375     | 5000                      | 1875                       | 288.5                       | 3.6        |
|                                                                                                                        | 14.50      | 220                       | 0.380     | 4830                      | 1835                       | 303.0                       | 4.2        |
|                                                                                                                        | 14.80      | 220                       | 0.385     | 4730                      | 1820                       | 313.0                       | 4.2        |
|                                                                                                                        | 15.00      | 220                       | 0.390     | 4670                      | 1820                       | 321.5                       | 4.2        |
|                                                                                                                        | 15.50      | 220                       | 0.400     | 4520                      | 1810                       | 341.5                       | 4.3        |
|                                                                                                                        | 16.00      | 220                       | 0.405     | 4375                      | 1770                       | 356.0                       | 4.3        |
|                                                                                                                        |            |                           |           |                           |                            |                             |            |

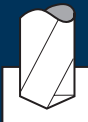


8xd



|                    |                       |                        |                        |  |  |  |                          |                       |              |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|-----------------------|--------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 |  |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>GG(G)</b> |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|-----------------------|--------------|

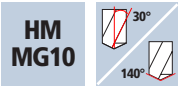
[illegible]

| Application                                                                       | Matières                   | d1<br>[mm] | v <sub>c</sub><br>[m/min]   | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|----------------------------|------------|-----------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²      | 4.00       | 130                         | 0.085     | 10345                     | 880                        | 11.0                        | 2.4        |
|                                                                                   |                            | 5.00       | 130                         | 0.105     | 8275                      | 870                        | 17.0                        | 3.3        |
|                                                                                   |                            | 6.00       | 130                         | 0.125     | 6895                      | 860                        | 24.5                        | 3.3        |
|                                                                                   |                            | 7.00       | 130                         | 0.145     | 5910                      | 855                        | 33.0                        | 4.5        |
|                                                                                   |                            | 8.00       | 130                         | 0.170     | 5175                      | 880                        | 44.0                        | 4.3        |
|                                                                                   |                            | 9.00       | 130                         | 0.190     | 4600                      | 875                        | 55.5                        | 5.5        |
|                                                                                   |                            | 10.00      | 130                         | 0.210     | 4140                      | 870                        | 68.5                        | 5.5        |
|                                                                                   |                            | 11.00      | 130                         | 0.230     | 3760                      | 865                        | 82.0                        | 6.7        |
|                                                                                   |                            | 12.00      | 130                         | 0.255     | 3450                      | 880                        | 99.5                        | 6.6        |
|                                                                                   |                            |            | Aciers<br>500 - 850 N/mm²   | 4.00      | 100                       | 0.085                      | 7960                        | 675        |
| 5.00                                                                              | 100                        |            |                             | 0.105     | 6365                      | 670                        | 13.0                        | 4.3        |
| 6.00                                                                              | 100                        |            |                             | 0.125     | 5305                      | 665                        | 19.0                        | 4.3        |
| 7.00                                                                              | 100                        |            |                             | 0.145     | 4545                      | 660                        | 25.5                        | 5.8        |
| 8.00                                                                              | 100                        |            |                             | 0.170     | 3980                      | 675                        | 34.0                        | 5.6        |
| 9.00                                                                              | 100                        |            |                             | 0.190     | 3535                      | 670                        | 42.5                        | 7.2        |
| 10.00                                                                             | 100                        |            |                             | 0.210     | 3185                      | 670                        | 52.5                        | 7.2        |
| 11.00                                                                             | 100                        |            |                             | 0.230     | 2895                      | 665                        | 63.0                        | 8.7        |
| 12.00                                                                             | 100                        |            |                             | 0.255     | 2655                      | 675                        | 76.5                        | 8.6        |
|                                                                                   | Aciers<br>850 - 1100 N/mm² |            |                             | 4.00      | 70                        | 0.065                      | 5570                        | 360        |
|                                                                                   |                            | 5.00       | 70                          | 0.080     | 4455                      | 355                        | 7.0                         | 8.1        |
|                                                                                   |                            | 6.00       | 70                          | 0.095     | 3715                      | 355                        | 10.0                        | 8.0        |
|                                                                                   |                            | 7.00       | 70                          | 0.110     | 3185                      | 350                        | 13.5                        | 10.9       |
|                                                                                   |                            | 8.00       | 70                          | 0.130     | 2785                      | 360                        | 18.0                        | 10.5       |
|                                                                                   |                            | 9.00       | 70                          | 0.145     | 2475                      | 360                        | 23.0                        | 13.5       |
|                                                                                   |                            | 10.00      | 70                          | 0.160     | 2230                      | 355                        | 28.0                        | 13.6       |
|                                                                                   |                            | 11.00      | 70                          | 0.175     | 2025                      | 355                        | 33.5                        | 16.3       |
|                                                                                   |                            | 12.00      | 70                          | 0.190     | 1855                      | 350                        | 39.5                        | 16.5       |
|                                                                                   |                            |            | Aciers<br>1100 - 1300 N/mm² | 4.00      | 50                        | 0.055                      | 3980                        | 220        |
| 5.00                                                                              | 50                         |            |                             | 0.065     | 3185                      | 205                        | 4.0                         | 14.0       |
| 6.00                                                                              | 50                         |            |                             | 0.080     | 2655                      | 210                        | 6.0                         | 13.5       |
| 7.00                                                                              | 50                         |            |                             | 0.095     | 2275                      | 215                        | 8.5                         | 17.8       |
| 8.00                                                                              | 50                         |            |                             | 0.105     | 1990                      | 210                        | 10.5                        | 18.1       |
| 9.00                                                                              | 50                         |            |                             | 0.120     | 1770                      | 210                        | 13.5                        | 23.1       |
| 10.00                                                                             | 50                         |            |                             | 0.135     | 1590                      | 215                        | 17.0                        | 22.4       |
| 11.00                                                                             | 50                         |            |                             | 0.145     | 1445                      | 210                        | 20.0                        | 27.6       |
| 12.00                                                                             | 50                         |            |                             | 0.160     | 1325                      | 210                        | 24.0                        | 27.5       |

| Matières                                                                                                               | d1<br>[mm]                   | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 4.00                         | 50                        | 0.045     | 3980                      | 180                        | 2.5                         | 11.6       |
|                                                                                                                        | 5.00                         | 50                        | 0.055     | 3185                      | 175                        | 3.5                         | 16.4       |
|                                                                                                                        | 6.00                         | 50                        | 0.070     | 2655                      | 185                        | 5.0                         | 15.4       |
|                                                                                                                        | 7.00                         | 50                        | 0.080     | 2275                      | 180                        | 7.0                         | 21.2       |
|                                                                                                                        | 8.00                         | 50                        | 0.090     | 1990                      | 180                        | 9.0                         | 21.1       |
|                                                                                                                        | 9.00                         | 50                        | 0.105     | 1770                      | 185                        | 12.0                        | 26.2       |
|                                                                                                                        | 10.00                        | 50                        | 0.115     | 1590                      | 185                        | 14.5                        | 26.0       |
|                                                                                                                        | 11.00                        | 50                        | 0.125     | 1445                      | 180                        | 17.0                        | 32.2       |
|                                                                                                                        | 12.00                        | 50                        | 0.135     | 1325                      | 180                        | 20.5                        | 32.1       |
|                                                                                                                        | Fonte<br>grise / sphéroïdale | 4.00                      | 150       | 0.090                     | 11935                      | 1075                        | 13.5       |
| 5.00                                                                                                                   |                              | 150                       | 0.115     | 9550                      | 1100                       | 21.5                        | 2.6        |
| 6.00                                                                                                                   |                              | 150                       | 0.135     | 7960                      | 1075                       | 30.5                        | 2.6        |
| 7.00                                                                                                                   |                              | 150                       | 0.160     | 6820                      | 1090                       | 42.0                        | 3.5        |
| 8.00                                                                                                                   |                              | 150                       | 0.185     | 5970                      | 1105                       | 55.5                        | 3.4        |
| 9.00                                                                                                                   |                              | 150                       | 0.205     | 5305                      | 1090                       | 69.5                        | 4.4        |
| 10.00                                                                                                                  |                              | 150                       | 0.230     | 4775                      | 1100                       | 86.5                        | 4.4        |
| 11.00                                                                                                                  |                              | 150                       | 0.250     | 4340                      | 1085                       | 103.0                       | 5.3        |
| 12.00                                                                                                                  |                              | 150                       | 0.275     | 3980                      | 1095                       | 124.0                       | 5.3        |
| Aluminium corroyé<br>Si < 6%                                                                                           |                              | 4.00                      | 200       | 0.080                     | 15915                      | 1275                        | 16.0       |
|                                                                                                                        | 5.00                         | 200                       | 0.100     | 12730                     | 1275                       | 25.0                        | 2.2        |
|                                                                                                                        | 6.00                         | 200                       | 0.120     | 10610                     | 1275                       | 36.0                        | 2.2        |
|                                                                                                                        | 7.00                         | 200                       | 0.140     | 9095                      | 1275                       | 49.0                        | 3.0        |
|                                                                                                                        | 8.00                         | 200                       | 0.160     | 7960                      | 1275                       | 64.0                        | 3.0        |
|                                                                                                                        | 9.00                         | 200                       | 0.180     | 7075                      | 1275                       | 81.0                        | 3.8        |
|                                                                                                                        | 10.00                        | 200                       | 0.200     | 6365                      | 1275                       | 100.0                       | 3.8        |
|                                                                                                                        | 11.00                        | 200                       | 0.220     | 5785                      | 1275                       | 121.0                       | 4.5        |
|                                                                                                                        | 12.00                        | 200                       | 0.240     | 5305                      | 1275                       | 144.0                       | 4.5        |
|                                                                                                                        |                              |                           |           |                           |                            |                             |            |
|                                                                                                                        |                              |                           |           |                           |                            |                             |            |
|                                                                                                                        |                              |                           |           |                           |                            |                             |            |
|                                                                                                                        |                              |                           |           |                           |                            |                             |            |
|                                                                                                                        |                              |                           |           |                           |                            |                             |            |
|                                                                                                                        |                              |                           |           |                           |                            |                             |            |
|                                                                                                                        |                              |                           |           |                           |                            |                             |            |
|                                                                                                                        |                              |                           |           |                           |                            |                             |            |

# Forets hélicoïdaux Supradrill® N

8xd



|             |                |                 |  |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|

| Exemple: N° cde     |          |          |     |     |    |                  | DURO-SD |   |
|---------------------|----------|----------|-----|-----|----|------------------|---------|---|
| N° d'article Code-ø |          |          |     |     |    |                  | B52020  |   |
| B52020 .0400        |          |          |     |     |    |                  | B53020  |   |
| ø<br>Code           | d1<br>m7 | d2<br>h6 | l1  | l2  | l4 | L <sub>max</sub> |         |   |
| .0400               | 4.0      | 6        | 82  | 44  | 36 | 34.9             |         | ● |
| .0420               | 4.2      | 6        | 82  | 44  | 36 | 34.8             |         | ● |
| .0450               | 4.5      | 6        | 82  | 44  | 36 | 34.6             |         | ● |
| .0480               | 4.8      | 6        | 82  | 44  | 36 | 34.4             |         | ● |
| .0500               | 5.0      | 6        | 95  | 57  | 36 | 47.7             |         | ● |
| .0550               | 5.5      | 6        | 95  | 57  | 36 | 47.5             |         | ● |
| .0580               | 5.8      | 6        | 95  | 57  | 36 | 47.3             |         | ● |
| .0600               | 6.0      | 6        | 95  | 57  | 36 | 47.4             |         | ● |
| .0650               | 6.5      | 8        | 114 | 76  | 36 | 64.1             |         | ● |
| .0680               | 6.8      | 8        | 114 | 76  | 36 | 63.8             |         | ● |
| .0700               | 7.0      | 8        | 114 | 76  | 36 | 63.7             |         | ● |
| .0750               | 7.5      | 8        | 114 | 76  | 36 | 63.4             |         | ● |
| .0780               | 7.8      | 8        | 114 | 76  | 36 | 63.3             |         | ● |
| .0800               | 8.0      | 8        | 114 | 76  | 36 | 63.3             |         | ● |
| .0850               | 8.5      | 10       | 138 | 95  | 40 | 81.0             |         | ● |
| .0900               | 9.0      | 10       | 138 | 95  | 40 | 80.7             |         | ● |
| .0950               | 9.5      | 10       | 138 | 95  | 40 | 80.4             |         | ● |
| .1000               | 10.0     | 10       | 138 | 95  | 40 | 80.2             |         | ● |
| .1050               | 10.5     | 12       | 162 | 114 | 45 | 97.0             |         | ● |
| .1100               | 11.0     | 12       | 162 | 114 | 45 | 96.6             |         | ● |
| .1150               | 11.5     | 12       | 162 | 114 | 45 | 96.4             |         | ● |
| .1200               | 12.0     | 12       | 162 | 114 | 45 | 96.2             |         | ● |



| Application                       |
|-----------------------------------|
| Aciers<br>< 500 N/mm <sup>2</sup> |

|                                       |
|---------------------------------------|
| Aciers<br>500 - 850 N/mm <sup>2</sup> |
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|                                        |
|----------------------------------------|
| Aciers<br>850 - 1100 N/mm <sup>2</sup> |
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|                                         |
|-----------------------------------------|
| Aciers<br>1100 - 1300 N/mm <sup>2</sup> |
|-----------------------------------------|

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 12.50      | 130                       | 0.265     | 3310                      | 875                        | 107.5                       | 7.7        |
| 13.00      | 130                       | 0.275     | 3185                      | 875                        | 116.0                       | 7.7        |
| 13.50      | 130                       | 0.285     | 3065                      | 875                        | 125.0                       | 7.7        |
| 14.00      | 130                       | 0.295     | 2955                      | 870                        | 134.0                       | 7.7        |
| 14.50      | 130                       | 0.305     | 2855                      | 870                        | 143.5                       | 8.9        |
| 15.00      | 130                       | 0.315     | 2760                      | 870                        | 153.5                       | 8.9        |
| 16.00      | 130                       | 0.335     | 2585                      | 865                        | 174.0                       | 8.9        |
|            |                           |           |                           |                            |                             |            |

|       |     |       |      |     |       |      |
|-------|-----|-------|------|-----|-------|------|
| 12.50 | 100 | 0.265 | 2545 | 675 | 83.0  | 10.0 |
| 13.00 | 100 | 0.275 | 2450 | 675 | 89.5  | 10.0 |
| 13.50 | 100 | 0.285 | 2360 | 675 | 96.5  | 10.0 |
| 14.00 | 100 | 0.295 | 2275 | 670 | 103.0 | 10.0 |
| 14.50 | 100 | 0.305 | 2195 | 670 | 110.5 | 11.5 |
| 15.00 | 100 | 0.315 | 2120 | 670 | 118.5 | 11.5 |
| 16.00 | 100 | 0.335 | 1990 | 665 | 133.5 | 11.5 |
|       |     |       |      |     |       |      |

|       |    |       |      |     |      |      |
|-------|----|-------|------|-----|------|------|
| 12.50 | 70 | 0.200 | 1785 | 355 | 43.5 | 19.1 |
| 13.00 | 70 | 0.210 | 1715 | 360 | 48.0 | 18.8 |
| 13.50 | 70 | 0.215 | 1650 | 355 | 51.0 | 19.0 |
| 14.00 | 70 | 0.225 | 1590 | 360 | 55.5 | 18.7 |
| 14.50 | 70 | 0.230 | 1535 | 355 | 58.5 | 21.8 |
| 15.00 | 70 | 0.240 | 1485 | 355 | 62.5 | 21.7 |
| 16.00 | 70 | 0.255 | 1395 | 355 | 71.5 | 21.6 |
|       |    |       |      |     |      |      |

|       |    |       |      |     |      |      |
|-------|----|-------|------|-----|------|------|
| 12.50 | 50 | 0.165 | 1275 | 210 | 26.0 | 32.3 |
| 13.00 | 50 | 0.175 | 1225 | 215 | 28.5 | 31.4 |
| 13.50 | 50 | 0.180 | 1180 | 210 | 30.0 | 32.1 |
| 14.00 | 50 | 0.185 | 1135 | 210 | 32.5 | 32.0 |
| 14.50 | 50 | 0.195 | 1100 | 215 | 35.5 | 36.0 |
| 15.00 | 50 | 0.200 | 1060 | 210 | 37.0 | 36.7 |
| 16.00 | 50 | 0.215 | 995  | 215 | 43.0 | 35.7 |
|       |    |       |      |     |      |      |

| Matières                                                                                                   |
|------------------------------------------------------------------------------------------------------------|
| Aciers à outil pour travail à froid (12% Cr) fortement allié [1.2379]<br>Aciers inoxydables [Cr-Ni/1.4301] |

|                           |
|---------------------------|
| Fonte grise / sphéroïdale |
|---------------------------|

|                           |
|---------------------------|
| Aluminium corroyé Si < 6% |
|---------------------------|

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 12.50      | 50                        | 0.145     | 1275                      | 185                        | 22.5                        | 36.6       |
| 13.00      | 50                        | 0.150     | 1225                      | 185                        | 24.5                        | 36.5       |
| 13.50      | 50                        | 0.155     | 1180                      | 185                        | 26.5                        | 36.4       |
| 14.00      | 50                        | 0.160     | 1135                      | 180                        | 27.5                        | 37.4       |
| 14.50      | 50                        | 0.165     | 1100                      | 180                        | 29.5                        | 43.0       |
| 15.00      | 50                        | 0.170     | 1060                      | 180                        | 32.0                        | 42.9       |
| 16.00      | 50                        | 0.185     | 995                       | 185                        | 37.0                        | 41.5       |
|            |                           |           |                           |                            |                             |            |

|       |     |       |      |      |       |     |
|-------|-----|-------|------|------|-------|-----|
| 12.50 | 150 | 0.285 | 3820 | 1090 | 134.0 | 6.2 |
| 13.00 | 150 | 0.295 | 3675 | 1085 | 144.0 | 6.2 |
| 13.50 | 150 | 0.310 | 3535 | 1095 | 156.5 | 6.2 |
| 14.00 | 150 | 0.320 | 3410 | 1090 | 168.0 | 6.2 |
| 14.50 | 150 | 0.330 | 3295 | 1085 | 179.0 | 7.1 |
| 15.00 | 150 | 0.345 | 3185 | 1100 | 194.5 | 7.0 |
| 16.00 | 150 | 0.365 | 2985 | 1090 | 219.0 | 7.0 |
|       |     |       |      |      |       |     |

|       |     |       |      |      |       |     |
|-------|-----|-------|------|------|-------|-----|
| 12.50 | 200 | 0.250 | 5095 | 1275 | 156.5 | 5.3 |
| 13.00 | 200 | 0.260 | 4895 | 1275 | 169.0 | 5.3 |
| 13.50 | 200 | 0.270 | 4715 | 1275 | 182.5 | 5.3 |
| 14.00 | 200 | 0.280 | 4545 | 1275 | 196.5 | 5.3 |
| 14.50 | 200 | 0.290 | 4390 | 1275 | 210.5 | 6.1 |
| 15.00 | 200 | 0.300 | 4245 | 1275 | 225.5 | 6.1 |
| 16.00 | 200 | 0.320 | 3980 | 1275 | 256.5 | 6.0 |
|       |     |       |      |      |       |     |

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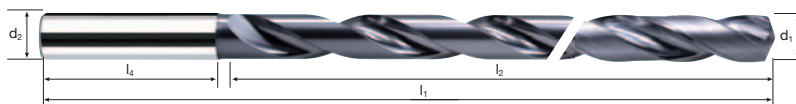
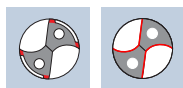
|                    |                       |                        |  |  |  |  |                          |  |                           |
|--------------------|-----------------------|------------------------|--|--|--|--|--------------------------|--|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 |  |  |  |  | <b>Inox</b><br>Stainless |  | <b>GG(G)</b><br>Aluminium |
|--------------------|-----------------------|------------------------|--|--|--|--|--------------------------|--|---------------------------|

[illegible]

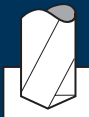
| Application                                                                       | Matières                   | d1<br>[mm] | v <sub>c</sub><br>[m/min]   | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|----------------------------|------------|-----------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²      | 3.00       | 100                         | 0.120     | 10610                     | 1275                       | 9.0                         | 2.4        |
|                                                                                   |                            | 4.00       | 100                         | 0.120     | 7960                      | 955                        | 12.0                        | 3.8        |
|                                                                                   |                            | 5.00       | 100                         | 0.120     | 6365                      | 765                        | 15.0                        | 6.0        |
|                                                                                   |                            | 6.00       | 100                         | 0.150     | 5305                      | 795                        | 22.5                        | 7.0        |
|                                                                                   |                            | 8.00       | 100                         | 0.150     | 3980                      | 595                        | 30.0                        | 12.2       |
|                                                                                   |                            | 10.00      | 100                         | 0.200     | 3185                      | 635                        | 50.0                        | 14.5       |
|                                                                                   |                            | 12.00      | 100                         | 0.200     | 2655                      | 530                        | 60.0                        | 20.9       |
|                                                                                   |                            | 14.00      | 100                         | 0.240     | 2275                      | 545                        | 84.0                        | 23.3       |
|                                                                                   |                            | 16.00      | 100                         | 0.240     | 1990                      | 480                        | 96.5                        | 30.5       |
|                                                                                   |                            |            | Aciers<br>500 - 850 N/mm²   | 3.00      | 75                        | 0.115                      | 7960                        | 915        |
| 4.00                                                                              | 75                         |            |                             | 0.115     | 5970                      | 685                        | 8.5                         | 5.3        |
| 5.00                                                                              | 75                         |            |                             | 0.115     | 4775                      | 550                        | 11.0                        | 8.3        |
| 6.00                                                                              | 75                         |            |                             | 0.145     | 3980                      | 575                        | 16.5                        | 9.7        |
| 8.00                                                                              | 75                         |            |                             | 0.145     | 2985                      | 435                        | 22.0                        | 16.7       |
| 10.00                                                                             | 75                         |            |                             | 0.190     | 2385                      | 455                        | 35.5                        | 20.2       |
| 12.00                                                                             | 75                         |            |                             | 0.190     | 1990                      | 380                        | 43.0                        | 29.2       |
| 14.00                                                                             | 75                         |            |                             | 0.230     | 1705                      | 390                        | 60.0                        | 32.6       |
| 16.00                                                                             | 75                         |            |                             | 0.230     | 1490                      | 345                        | 69.5                        | 42.4       |
|                                                                                   | Aciers<br>850 - 1100 N/mm² |            |                             | 3.00      | 50                        | 0.100                      | 5305                        | 530        |
|                                                                                   |                            | 4.00       | 50                          | 0.100     | 3980                      | 400                        | 5.0                         | 9.0        |
|                                                                                   |                            | 5.00       | 50                          | 0.100     | 3185                      | 320                        | 6.5                         | 14.3       |
|                                                                                   |                            | 6.00       | 50                          | 0.140     | 2655                      | 370                        | 10.5                        | 15.1       |
|                                                                                   |                            | 8.00       | 50                          | 0.140     | 1990                      | 280                        | 14.0                        | 25.9       |
|                                                                                   |                            | 10.00      | 50                          | 0.180     | 1590                      | 285                        | 22.5                        | 32.2       |
|                                                                                   |                            | 12.00      | 50                          | 0.180     | 1325                      | 240                        | 27.0                        | 46.3       |
|                                                                                   |                            | 14.00      | 50                          | 0.220     | 1135                      | 250                        | 38.5                        | 50.9       |
|                                                                                   |                            | 16.00      | 50                          | 0.220     | 995                       | 220                        | 44.0                        | 66.5       |
|                                                                                   |                            |            | Aciers<br>1100 - 1300 N/mm² | 3.00      | 35                        | 0.090                      | 3715                        | 335        |
| 4.00                                                                              | 35                         |            |                             | 0.090     | 2785                      | 250                        | 3.0                         | 14.4       |
| 5.00                                                                              | 35                         |            |                             | 0.090     | 2230                      | 200                        | 4.0                         | 22.9       |
| 6.00                                                                              | 35                         |            |                             | 0.125     | 1855                      | 230                        | 6.5                         | 24.3       |
| 8.00                                                                              | 35                         |            |                             | 0.125     | 1395                      | 175                        | 9.0                         | 41.5       |
| 10.00                                                                             | 35                         |            |                             | 0.160     | 1115                      | 180                        | 14.0                        | 51.0       |
| 12.00                                                                             | 35                         |            |                             | 0.160     | 930                       | 150                        | 17.0                        | 74.0       |
| 14.00                                                                             | 35                         |            |                             | 0.200     | 795                       | 160                        | 24.5                        | 79.5       |
| 16.00                                                                             | 35                         |            |                             | 0.200     | 695                       | 140                        | 28.0                        | 104.6      |

| Matières                                                                       | d1<br>[mm]                   | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|--------------------------------------------------------------------------------|------------------------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379] | 3.00                         | 40                        | 0.100     | 4245                      | 425                        | 3.0                         | 7.3        |
|                                                                                | 4.00                         | 40                        | 0.100     | 3185                      | 320                        | 4.0                         | 11.3       |
|                                                                                | 5.00                         | 40                        | 0.100     | 2545                      | 255                        | 5.0                         | 18.0       |
|                                                                                | 6.00                         | 40                        | 0.140     | 2120                      | 295                        | 8.5                         | 18.9       |
|                                                                                | 8.00                         | 40                        | 0.140     | 1590                      | 225                        | 11.5                        | 32.3       |
|                                                                                | 10.00                        | 40                        | 0.180     | 1275                      | 230                        | 18.0                        | 39.9       |
|                                                                                | 12.00                        | 40                        | 0.180     | 1060                      | 190                        | 21.5                        | 58.4       |
|                                                                                | 14.00                        | 40                        | 0.220     | 910                       | 200                        | 31.0                        | 63.6       |
|                                                                                | 16.00                        | 40                        | 0.220     | 795                       | 175                        | 35.0                        | 83.7       |
|                                                                                | Fonte<br>grise / sphéroïdale | 3.00                      | 80        | 0.160                     | 8490                       | 1360                        | 9.5        |
| 4.00                                                                           |                              | 80                        | 0.160     | 6365                      | 1020                       | 13.0                        | 3.5        |
| 5.00                                                                           |                              | 80                        | 0.160     | 5095                      | 815                        | 16.0                        | 5.6        |
| 6.00                                                                           |                              | 80                        | 0.210     | 4245                      | 890                        | 25.0                        | 6.3        |
| 8.00                                                                           |                              | 80                        | 0.210     | 3185                      | 670                        | 33.5                        | 10.8       |
| 10.00                                                                          |                              | 80                        | 0.260     | 2545                      | 660                        | 52.0                        | 13.9       |
| 12.00                                                                          |                              | 80                        | 0.260     | 2120                      | 550                        | 62.0                        | 20.2       |
| 14.00                                                                          |                              | 80                        | 0.320     | 1820                      | 580                        | 89.5                        | 21.9       |
| 16.00                                                                          |                              | 80                        | 0.320     | 1590                      | 510                        | 102.5                       | 28.7       |
| Aluminium corroyé<br>Si < 6%                                                   |                              | 3.00                      | 180       | 0.120                     | 19100                      | 2290                        | 16.0       |
|                                                                                | 4.00                         | 180                       | 0.120     | 14325                     | 1720                       | 21.5                        | 2.1        |
|                                                                                | 5.00                         | 180                       | 0.120     | 11460                     | 1375                       | 27.0                        | 3.3        |
|                                                                                | 6.00                         | 180                       | 0.150     | 9550                      | 1435                       | 40.5                        | 3.9        |
|                                                                                | 8.00                         | 180                       | 0.150     | 7160                      | 1075                       | 54.0                        | 6.8        |
|                                                                                | 10.00                        | 180                       | 0.200     | 5730                      | 1145                       | 90.0                        | 8.0        |
|                                                                                | 12.00                        | 180                       | 0.200     | 4775                      | 955                        | 108.0                       | 11.6       |
|                                                                                | 14.00                        | 180                       | 0.240     | 4095                      | 985                        | 151.5                       | 12.9       |
|                                                                                | 16.00                        | 180                       | 0.240     | 3580                      | 860                        | 173.0                       | 17.0       |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |

## 15xd

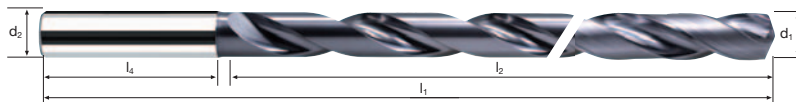
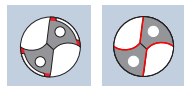
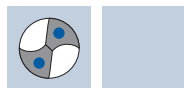
GG(G)  
Aluminium

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| Application                                                                       | Matières                     | d1<br>[mm] | v <sub>c</sub><br>[m/min]   | f<br>[mm]  | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm³/min]            | T<br>[sek]                 |
|-----------------------------------------------------------------------------------|------------------------------|------------|-----------------------------|------------|---------------------------|----------------------------|---------------------------|----------------------------|
|  | Aciers<br>< 500 N/mm²        | 3.00       | 100                         | 0.120      | 10610                     | 1275                       | 9.0                       | 3.3                        |
|                                                                                   |                              | 4.00       | 100                         | 0.120      | 7960                      | 955                        | 12.0                      | 5.0                        |
|                                                                                   |                              | 5.00       | 100                         | 0.120      | 6365                      | 765                        | 15.0                      | 8.0                        |
|                                                                                   |                              | 6.00       | 100                         | 0.150      | 5305                      | 795                        | 22.5                      | 9.1                        |
|                                                                                   |                              | 8.00       | 100                         | 0.150      | 3980                      | 595                        | 30.0                      | 16.2                       |
|                                                                                   |                              | 10.00      | 100                         | 0.200      | 3185                      | 635                        | 50.0                      | 19.2                       |
|                                                                                   |                              | 12.00      | 100                         | 0.200      | 2655                      | 530                        | 60.0                      | 27.2                       |
|                                                                                   |                              | 14.00      | 100                         | 0.240      | 2275                      | 545                        | 84.0                      | 31.0                       |
|                                                                                   |                              | 16.00      | 100                         | 0.240      | 1990                      | 480                        | 96.5                      | 40.5                       |
|                                                                                   |                              |            | Aciers<br>500 - 850 N/mm²   | 3.00       | 75                        | 0.115                      | 7960                      | 915                        |
| 4.00                                                                              | 75                           |            |                             | 0.115      | 5970                      | 685                        | 8.5                       | 7.0                        |
| 5.00                                                                              | 75                           |            |                             | 0.115      | 4775                      | 550                        | 11.0                      | 11.1                       |
| 6.00                                                                              | 75                           |            |                             | 0.145      | 3980                      | 575                        | 16.5                      | 12.6                       |
| 8.00                                                                              | 75                           |            |                             | 0.145      | 2985                      | 435                        | 22.0                      | 22.2                       |
| 10.00                                                                             | 75                           |            |                             | 0.190      | 2385                      | 455                        | 35.5                      | 26.8                       |
| 12.00                                                                             | 75                           |            |                             | 0.190      | 1990                      | 380                        | 43.0                      | 37.9                       |
| 14.00                                                                             | 75                           |            |                             | 0.230      | 1705                      | 390                        | 60.0                      | 43.4                       |
| 16.00                                                                             | 75                           |            |                             | 0.230      | 1490                      | 345                        | 69.5                      | 56.3                       |
|                                                                                   | Aciers<br>850 - 1100 N/mm²   |            |                             | 3.00       | 50                        | 0.100                      | 5305                      | 530                        |
|                                                                                   |                              | 4.00       | 50                          | 0.100      | 3980                      | 400                        | 5.0                       | 12.0                       |
|                                                                                   |                              | 5.00       | 50                          | 0.100      | 3185                      | 320                        | 6.5                       | 19.0                       |
|                                                                                   |                              | 6.00       | 50                          | 0.140      | 2655                      | 370                        | 10.5                      | 19.6                       |
|                                                                                   |                              | 8.00       | 50                          | 0.140      | 1990                      | 280                        | 14.0                      | 34.5                       |
|                                                                                   |                              | 10.00      | 50                          | 0.180      | 1590                      | 285                        | 22.5                      | 42.7                       |
|                                                                                   |                              | 12.00      | 50                          | 0.180      | 1325                      | 240                        | 27.0                      | 60.0                       |
|                                                                                   |                              | 14.00      | 50                          | 0.220      | 1135                      | 250                        | 38.5                      | 67.7                       |
|                                                                                   |                              | 16.00      | 50                          | 0.220      | 995                       | 220                        | 44.0                      | 88.4                       |
|                                                                                   |                              |            | Aciers<br>1100 - 1300 N/mm² | 3.00       | 35                        | 0.090                      | 3715                      | 335                        |
| 4.00                                                                              | 35                           |            |                             | 0.090      | 2785                      | 250                        | 3.0                       | 19.2                       |
| 5.00                                                                              | 35                           |            |                             | 0.090      | 2230                      | 200                        | 4.0                       | 30.4                       |
| 6.00                                                                              | 35                           |            |                             | 0.125      | 1855                      | 230                        | 6.5                       | 31.6                       |
| 8.00                                                                              | 35                           |            |                             | 0.125      | 1395                      | 175                        | 9.0                       | 55.2                       |
| 10.00                                                                             | 35                           |            |                             | 0.160      | 1115                      | 180                        | 14.0                      | 67.7                       |
| 12.00                                                                             | 35                           |            |                             | 0.160      | 930                       | 150                        | 17.0                      | 96.0                       |
| 14.00                                                                             | 35                           |            |                             | 0.200      | 795                       | 160                        | 24.5                      | 105.8                      |
| 16.00                                                                             | 35                           |            |                             | 0.200      | 695                       | 140                        | 28.0                      | 138.9                      |
| Matières                                                                          |                              |            |                             | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm]                  | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]    | 3.00                         | 40         | 0.100                       | 4245       | 425                       | 3.0                        | 9.8                       |                            |
|                                                                                   | 4.00                         | 40         | 0.100                       | 3185       | 320                       | 4.0                        | 15.0                      |                            |
|                                                                                   | 5.00                         | 40         | 0.100                       | 2545       | 255                       | 5.0                        | 23.9                      |                            |
|                                                                                   | 6.00                         | 40         | 0.140                       | 2120       | 295                       | 8.5                        | 24.6                      |                            |
|                                                                                   | 8.00                         | 40         | 0.140                       | 1590       | 225                       | 11.5                       | 42.9                      |                            |
|                                                                                   | 10.00                        | 40         | 0.180                       | 1275       | 230                       | 18.0                       | 53.0                      |                            |
|                                                                                   | 12.00                        | 40         | 0.180                       | 1060       | 190                       | 21.5                       | 75.8                      |                            |
|                                                                                   | 14.00                        | 40         | 0.220                       | 910        | 200                       | 31.0                       | 84.6                      |                            |
|                                                                                   | 16.00                        | 40         | 0.220                       | 795        | 175                       | 35.0                       | 111.1                     |                            |
|                                                                                   | Fonte<br>grise / sphéroïdale | 3.00       | 80                          | 0.160      | 8490                      | 1360                       | 9.5                       | 3.1                        |
| 4.00                                                                              |                              | 80         | 0.160                       | 6365       | 1020                      | 13.0                       | 4.7                       |                            |
| 5.00                                                                              |                              | 80         | 0.160                       | 5095       | 815                       | 16.0                       | 7.5                       |                            |
| 6.00                                                                              |                              | 80         | 0.210                       | 4245       | 890                       | 25.0                       | 8.2                       |                            |
| 8.00                                                                              |                              | 80         | 0.210                       | 3185       | 670                       | 33.5                       | 14.4                      |                            |
| 10.00                                                                             |                              | 80         | 0.260                       | 2545       | 660                       | 52.0                       | 18.5                      |                            |
| 12.00                                                                             |                              | 80         | 0.260                       | 2120       | 550                       | 62.0                       | 26.2                      |                            |
| 14.00                                                                             |                              | 80         | 0.320                       | 1820       | 580                       | 89.5                       | 29.2                      |                            |
| 16.00                                                                             |                              | 80         | 0.320                       | 1590       | 510                       | 102.5                      | 38.1                      |                            |
| Aluminium corroyé<br>Si < 6%                                                      |                              | 3.00       | 180                         | 0.120      | 19100                     | 2290                       | 16.0                      | 1.8                        |
|                                                                                   | 4.00                         | 180        | 0.120                       | 14325      | 1720                      | 21.5                       | 2.8                       |                            |
|                                                                                   | 5.00                         | 180        | 0.120                       | 11460      | 1375                      | 27.0                       | 4.4                       |                            |
|                                                                                   | 6.00                         | 180        | 0.150                       | 9550       | 1435                      | 40.5                       | 5.1                       |                            |
|                                                                                   | 8.00                         | 180        | 0.150                       | 7160       | 1075                      | 54.0                       | 9.0                       |                            |
|                                                                                   | 10.00                        | 180        | 0.200                       | 5730       | 1145                      | 90.0                       | 10.6                      |                            |
|                                                                                   | 12.00                        | 180        | 0.200                       | 4775       | 955                       | 108.0                      | 15.1                      |                            |
|                                                                                   | 14.00                        | 180        | 0.240                       | 4095       | 985                       | 151.5                      | 17.2                      |                            |
|                                                                                   | 16.00                        | 180        | 0.240                       | 3580       | 860                       | 173.0                      | 22.6                      |                            |
|                                                                                   |                              |            |                             |            |                           |                            |                           |                            |
|                                                                                   |                              |            |                             |            |                           |                            |                           |                            |
|                                                                                   |                              |            |                             |            |                           |                            |                           |                            |
|                                                                                   |                              |            |                             |            |                           |                            |                           |                            |
|                                                                                   |                              |            |                             |            |                           |                            |                           |                            |
|                                                                                   |                              |            |                             |            |                           |                            |                           |                            |
|                                                                                   |                              |            |                             |            |                           |                            |                           |                            |
|                                                                                   |                              |            |                             |            |                           |                            |                           |                            |
|                                                                                   |                              |            |                             |            |                           |                            |                           |                            |
|                                                                                   |                              |            |                             |            |                           |                            |                           |                            |



## 20xd



|                    |                       |                        |  |  |  |  |  |                                  |
|--------------------|-----------------------|------------------------|--|--|--|--|--|----------------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 |  |  |  |  |  | <b>GG(G)</b><br><b>Aluminium</b> |
|--------------------|-----------------------|------------------------|--|--|--|--|--|----------------------------------|

[illegible]

## Application

## Matières



**Aciers**  
**< 500 N/mm<sup>2</sup>**

**Aciers**  
500 - 850 N/mm<sup>2</sup>

**Aciers**  
850 - 1100 N/mm<sup>2</sup>

**Aciers**  
1100 - 1300 N/mm<sup>2</sup>

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 3.00       | 90                        | 0.120     | 9550                      | 1145                       | 8.0                         | 4.5        |
| 4.00       | 90                        | 0.120     | 7160                      | 860                        | 11.0                        | 7.0        |
| 5.00       | 90                        | 0.120     | 5730                      | 690                        | 13.5                        | 11.0       |
| 6.00       | 90                        | 0.150     | 4775                      | 715                        | 20.0                        | 12.7       |
| 8.00       | 90                        | 0.150     | 3580                      | 535                        | 27.0                        | 22.5       |
| 9.00       | 90                        | 0.200     | 3185                      | 635                        | 40.5                        | 21.2       |
| 10.00      | 90                        | 0.200     | 2865                      | 575                        | 45.0                        | 26.4       |
| 12.00      | 90                        | 0.200     | 2385                      | 475                        | 53.5                        | 37.9       |
| 14.00      | 90                        | 0.240     | 2045                      | 490                        | 75.5                        | 43.1       |
| 3.00       | 70                        | 0.115     | 7425                      | 855                        | 6.0                         | 6.1        |
| 4.00       | 70                        | 0.115     | 5570                      | 640                        | 8.0                         | 9.4        |
| 5.00       | 70                        | 0.115     | 4455                      | 510                        | 10.0                        | 14.9       |
| 6.00       | 70                        | 0.145     | 3715                      | 540                        | 15.5                        | 16.8       |
| 8.00       | 70                        | 0.145     | 2785                      | 405                        | 20.5                        | 29.8       |
| 9.00       | 70                        | 0.190     | 2475                      | 470                        | 30.0                        | 28.7       |
| 10.00      | 70                        | 0.190     | 2230                      | 425                        | 33.5                        | 35.7       |
| 12.00      | 70                        | 0.190     | 1855                      | 350                        | 39.5                        | 51.4       |
| 14.00      | 70                        | 0.230     | 1590                      | 365                        | 56.0                        | 57.9       |
| 3.00       | 45                        | 0.100     | 4775                      | 480                        | 3.5                         | 10.8       |
| 4.00       | 45                        | 0.100     | 3580                      | 360                        | 4.5                         | 16.7       |
| 5.00       | 45                        | 0.100     | 2865                      | 285                        | 5.5                         | 26.6       |
| 6.00       | 45                        | 0.140     | 2385                      | 335                        | 9.5                         | 27.0       |
| 8.00       | 45                        | 0.140     | 1790                      | 250                        | 12.5                        | 48.2       |
| 9.00       | 45                        | 0.180     | 1590                      | 285                        | 18.0                        | 47.3       |
| 10.00      | 45                        | 0.180     | 1430                      | 255                        | 20.0                        | 59.5       |
| 12.00      | 45                        | 0.180     | 1195                      | 215                        | 24.5                        | 83.7       |
| 14.00      | 45                        | 0.220     | 1025                      | 225                        | 34.5                        | 93.9       |
| 3.00       | 30                        | 0.090     | 3185                      | 285                        | 2.0                         | 18.2       |
| 4.00       | 30                        | 0.090     | 2385                      | 215                        | 2.5                         | 27.9       |
| 5.00       | 30                        | 0.090     | 1910                      | 170                        | 3.5                         | 44.6       |
| 6.00       | 30                        | 0.125     | 1590                      | 200                        | 5.5                         | 45.3       |
| 8.00       | 30                        | 0.125     | 1195                      | 150                        | 7.5                         | 80.4       |
| 9.00       | 30                        | 0.160     | 1060                      | 170                        | 11.0                        | 79.2       |
| 10.00      | 30                        | 0.160     | 955                       | 155                        | 12.0                        | 97.9       |
| 12.00      | 30                        | 0.160     | 795                       | 125                        | 14.0                        | 144.0      |
| 14.00      | 30                        | 0.200     | 680                       | 135                        | 21.0                        | 156.4      |

## Matières

## Matières

**Aciers à outil pour travail à froid (12% Cr) fortement allié**  
**[1.2379]**

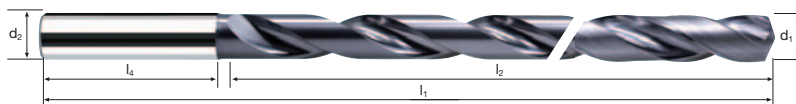
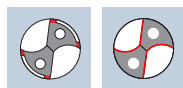
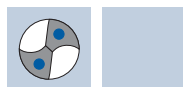
Fonte  
grise / sphéroïdale

Aluminium corroyé  
Si < 6%

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 3.00       | 35                        | 0.100     | 3715                      | 370                        | 2.5                         | 14.0       |
| 4.00       | 35                        | 0.100     | 2785                      | 280                        | 3.5                         | 21.4       |
| 5.00       | 35                        | 0.100     | 2230                      | 225                        | 4.5                         | 33.7       |
| 6.00       | 35                        | 0.140     | 1855                      | 260                        | 7.5                         | 34.8       |
| 8.00       | 35                        | 0.140     | 1395                      | 195                        | 10.0                        | 61.8       |
| 9.00       | 35                        | 0.180     | 1240                      | 225                        | 14.5                        | 59.9       |
| 10.00      | 35                        | 0.180     | 1115                      | 200                        | 15.5                        | 75.9       |
| 12.00      | 35                        | 0.180     | 930                       | 165                        | 18.5                        | 109.1      |
| 14.00      | 35                        | 0.220     | 795                       | 175                        | 27.0                        | 120.7      |
| 3.00       | 70                        | 0.160     | 7425                      | 1190                       | 8.5                         | 4.4        |
| 4.00       | 70                        | 0.160     | 5570                      | 890                        | 11.0                        | 6.7        |
| 5.00       | 70                        | 0.160     | 4455                      | 715                        | 14.0                        | 10.6       |
| 6.00       | 70                        | 0.210     | 3715                      | 780                        | 22.0                        | 11.6       |
| 8.00       | 70                        | 0.210     | 2785                      | 585                        | 29.5                        | 20.6       |
| 9.00       | 70                        | 0.260     | 2475                      | 645                        | 41.0                        | 20.9       |
| 10.00      | 70                        | 0.260     | 2230                      | 580                        | 45.5                        | 26.2       |
| 12.00      | 70                        | 0.260     | 1855                      | 480                        | 54.5                        | 37.5       |
| 14.00      | 70                        | 0.320     | 1590                      | 510                        | 78.5                        | 41.4       |
| 3.00       | 160                       | 0.120     | 16975                     | 2035                       | 14.5                        | 2.6        |
| 4.00       | 160                       | 0.120     | 12730                     | 1530                       | 19.0                        | 3.9        |
| 5.00       | 160                       | 0.120     | 10185                     | 1220                       | 24.0                        | 6.2        |
| 6.00       | 160                       | 0.150     | 8490                      | 1275                       | 36.0                        | 7.1        |
| 8.00       | 160                       | 0.150     | 6365                      | 955                        | 48.0                        | 12.6       |
| 9.00       | 160                       | 0.200     | 5660                      | 1130                       | 72.0                        | 11.9       |
| 10.00      | 160                       | 0.200     | 5095                      | 1020                       | 80.0                        | 14.9       |
| 12.00      | 160                       | 0.200     | 4245                      | 850                        | 96.0                        | 21.2       |
| 14.00      | 160                       | 0.240     | 3640                      | 875                        | 134.5                       | 24.1       |

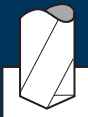
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## 25xd



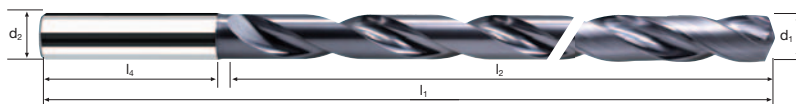
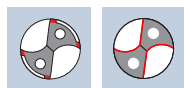
|                    |                       |                        |  |  |  |  |  |                                  |
|--------------------|-----------------------|------------------------|--|--|--|--|--|----------------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 |  |  |  |  |  | <b>GG(G)</b><br><b>Aluminium</b> |
|--------------------|-----------------------|------------------------|--|--|--|--|--|----------------------------------|

[illegible]

| Application                                                                       | Matières                   | d1<br>[mm] | v <sub>c</sub><br>[m/min]   | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|----------------------------|------------|-----------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²      | 3.00       | 90                          | 0.120     | 9550                      | 1145                       | 8.0                         | 5.5        |
|                                                                                   |                            | 4.00       | 90                          | 0.120     | 7160                      | 860                        | 11.0                        | 8.4        |
|                                                                                   |                            | 5.00       | 90                          | 0.120     | 5730                      | 690                        | 13.5                        | 13.2       |
|                                                                                   |                            | 6.00       | 90                          | 0.150     | 4775                      | 715                        | 20.0                        | 15.4       |
|                                                                                   |                            | 7.00       | 90                          | 0.150     | 4095                      | 615                        | 23.5                        | 20.4       |
|                                                                                   |                            | 8.00       | 90                          | 0.150     | 3580                      | 535                        | 27.0                        | 27.0       |
|                                                                                   |                            | 9.00       | 90                          | 0.200     | 3185                      | 635                        | 40.5                        | 25.5       |
|                                                                                   |                            | 10.00      | 90                          | 0.200     | 2865                      | 575                        | 45.0                        | 31.6       |
|                                                                                   |                            | 12.00      | 90                          | 0.200     | 2385                      | 475                        | 53.5                        | 46.1       |
|                                                                                   |                            |            | Aciers<br>500 - 850 N/mm²   | 3.00      | 70                        | 0.115                      | 7425                        | 855        |
| 4.00                                                                              | 70                         |            |                             | 0.115     | 5570                      | 640                        | 8.0                         | 11.3       |
| 5.00                                                                              | 70                         |            |                             | 0.115     | 4455                      | 510                        | 10.0                        | 17.8       |
| 6.00                                                                              | 70                         |            |                             | 0.145     | 3715                      | 540                        | 15.5                        | 20.3       |
| 7.00                                                                              | 70                         |            |                             | 0.145     | 3185                      | 460                        | 17.5                        | 27.3       |
| 8.00                                                                              | 70                         |            |                             | 0.145     | 2785                      | 405                        | 20.5                        | 35.7       |
| 9.00                                                                              | 70                         |            |                             | 0.190     | 2475                      | 470                        | 30.0                        | 34.4       |
| 10.00                                                                             | 70                         |            |                             | 0.190     | 2230                      | 425                        | 33.5                        | 42.8       |
| 12.00                                                                             | 70                         |            |                             | 0.190     | 1855                      | 350                        | 39.5                        | 62.6       |
|                                                                                   | Aciers<br>850 - 1100 N/mm² |            |                             | 3.00      | 45                        | 0.100                      | 4775                        | 480        |
|                                                                                   |                            | 4.00       | 45                          | 0.100     | 3580                      | 360                        | 4.5                         | 20.0       |
|                                                                                   |                            | 5.00       | 45                          | 0.100     | 2865                      | 285                        | 5.5                         | 31.9       |
|                                                                                   |                            | 6.00       | 45                          | 0.140     | 2385                      | 335                        | 9.5                         | 32.8       |
|                                                                                   |                            | 7.00       | 45                          | 0.140     | 2045                      | 285                        | 11.0                        | 44.1       |
|                                                                                   |                            | 8.00       | 45                          | 0.140     | 1790                      | 250                        | 12.5                        | 57.8       |
|                                                                                   |                            | 9.00       | 45                          | 0.180     | 1590                      | 285                        | 18.0                        | 56.7       |
|                                                                                   |                            | 10.00      | 45                          | 0.180     | 1430                      | 255                        | 20.0                        | 71.3       |
|                                                                                   |                            | 12.00      | 45                          | 0.180     | 1195                      | 215                        | 24.5                        | 101.9      |
|                                                                                   |                            |            | Aciers<br>1100 - 1300 N/mm² | 3.00      | 30                        | 0.090                      | 3185                        | 285        |
| 4.00                                                                              | 30                         |            |                             | 0.090     | 2385                      | 215                        | 2.5                         | 33.5       |
| 5.00                                                                              | 30                         |            |                             | 0.090     | 1910                      | 170                        | 3.5                         | 53.5       |
| 6.00                                                                              | 30                         |            |                             | 0.125     | 1590                      | 200                        | 5.5                         | 54.9       |
| 7.00                                                                              | 30                         |            |                             | 0.125     | 1365                      | 170                        | 6.5                         | 73.9       |
| 8.00                                                                              | 30                         |            |                             | 0.125     | 1195                      | 150                        | 7.5                         | 96.4       |
| 9.00                                                                              | 30                         |            |                             | 0.160     | 1060                      | 170                        | 11.0                        | 95.1       |
| 10.00                                                                             | 30                         |            |                             | 0.160     | 955                       | 155                        | 12.0                        | 117.3      |
| 12.00                                                                             | 30                         |            |                             | 0.160     | 795                       | 125                        | 14.0                        | 175.2      |

| Matières                                                                       | d1<br>[mm]                   | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|--------------------------------------------------------------------------------|------------------------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379] | 3.00                         | 35                        | 0.100     | 3715                      | 370                        | 2.5                         | 17.1       |
|                                                                                | 4.00                         | 35                        | 0.100     | 2785                      | 280                        | 3.5                         | 25.7       |
|                                                                                | 5.00                         | 35                        | 0.100     | 2230                      | 225                        | 4.5                         | 40.4       |
|                                                                                | 6.00                         | 35                        | 0.140     | 1855                      | 260                        | 7.5                         | 42.2       |
|                                                                                | 7.00                         | 35                        | 0.140     | 1590                      | 225                        | 8.5                         | 55.9       |
|                                                                                | 8.00                         | 35                        | 0.140     | 1395                      | 195                        | 10.0                        | 74.2       |
|                                                                                | 9.00                         | 35                        | 0.180     | 1240                      | 225                        | 14.5                        | 71.9       |
|                                                                                | 10.00                        | 35                        | 0.180     | 1115                      | 200                        | 15.5                        | 90.9       |
|                                                                                | 12.00                        | 35                        | 0.180     | 930                       | 165                        | 18.5                        | 132.7      |
|                                                                                | Fonte<br>grise / sphéroïdale | 3.00                      | 70        | 0.160                     | 7425                       | 1190                        | 8.5        |
| 4.00                                                                           |                              | 70                        | 0.160     | 5570                      | 890                        | 11.0                        | 8.1        |
| 5.00                                                                           |                              | 70                        | 0.160     | 4455                      | 715                        | 14.0                        | 12.7       |
| 6.00                                                                           |                              | 70                        | 0.210     | 3715                      | 780                        | 22.0                        | 14.1       |
| 7.00                                                                           |                              | 70                        | 0.210     | 3185                      | 670                        | 26.0                        | 18.8       |
| 8.00                                                                           |                              | 70                        | 0.210     | 2785                      | 585                        | 29.5                        | 24.7       |
| 9.00                                                                           |                              | 70                        | 0.260     | 2475                      | 645                        | 41.0                        | 25.1       |
| 10.00                                                                          |                              | 70                        | 0.260     | 2230                      | 580                        | 45.5                        | 31.3       |
| 12.00                                                                          |                              | 70                        | 0.260     | 1855                      | 480                        | 54.5                        | 45.6       |
| Aluminium corroyé<br>Si < 6%                                                   |                              | 3.00                      | 160       | 0.120                     | 16975                      | 2035                        | 14.5       |
|                                                                                | 4.00                         | 160                       | 0.120     | 12730                     | 1530                       | 19.0                        | 4.7        |
|                                                                                | 5.00                         | 160                       | 0.120     | 10185                     | 1220                       | 24.0                        | 7.5        |
|                                                                                | 6.00                         | 160                       | 0.150     | 8490                      | 1275                       | 36.0                        | 8.6        |
|                                                                                | 7.00                         | 160                       | 0.150     | 7275                      | 1090                       | 42.0                        | 11.5       |
|                                                                                | 8.00                         | 160                       | 0.150     | 6365                      | 955                        | 48.0                        | 15.1       |
|                                                                                | 9.00                         | 160                       | 0.200     | 5660                      | 1130                       | 72.0                        | 14.3       |
|                                                                                | 10.00                        | 160                       | 0.200     | 5095                      | 1020                       | 80.0                        | 17.8       |
|                                                                                | 12.00                        | 160                       | 0.200     | 4245                      | 850                        | 96.0                        | 25.8       |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |
|                                                                                |                              |                           |           |                           |                            |                             |            |

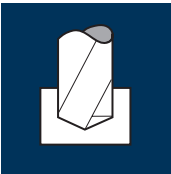
## 30xd



|                    |                       |                        |  |  |  |  |  |                                  |
|--------------------|-----------------------|------------------------|--|--|--|--|--|----------------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 |  |  |  |  |  | <b>GG(G)</b><br><b>Aluminium</b> |
|--------------------|-----------------------|------------------------|--|--|--|--|--|----------------------------------|

[illegible]

## Application



## Matières

**Aciers**  
**< 500 N/mm<sup>2</sup>**

**Aciers**  
500 - 850 N/mm<sup>2</sup>

**Aciers**  
850 - 1100 N/mm<sup>2</sup>

**Aciers inoxydables  
[Cr-Ni/1.4301]**

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 0.20       | 100                       | 0.004     | 60000                     | 240                        | 0.0                         | 0.3        |
| 0.30       | 100                       | 0.006     | 60000                     | 360                        | 0.0                         | 0.3        |
| 0.40       | 100                       | 0.008     | 60000                     | 480                        | 0.0                         | 0.3        |
| 0.50       | 100                       | 0.010     | 60000                     | 600                        | 0.0                         | 0.3        |
| 0.60       | 100                       | 0.012     | 53050                     | 635                        | 0.0                         | 0.3        |
| 0.70       | 100                       | 0.014     | 45475                     | 635                        | 0.0                         | 0.3        |
| 0.80       | 100                       | 0.016     | 39790                     | 635                        | 0.5                         | 0.4        |
| 0.90       | 100                       | 0.018     | 35370                     | 635                        | 0.5                         | 0.4        |
| 1.00       | 100                       | 0.020     | 31830                     | 635                        | 0.5                         | 0.5        |
| 0.20       | 80                        | 0.004     | 60000                     | 240                        | 0.0                         | 0.3        |
| 0.30       | 80                        | 0.007     | 60000                     | 420                        | 0.0                         | 0.2        |
| 0.40       | 80                        | 0.009     | 60000                     | 540                        | 0.0                         | 0.2        |
| 0.50       | 80                        | 0.011     | 50930                     | 560                        | 0.0                         | 0.3        |
| 0.60       | 80                        | 0.013     | 42440                     | 550                        | 0.0                         | 0.3        |
| 0.70       | 80                        | 0.016     | 36380                     | 580                        | 0.0                         | 0.4        |
| 0.80       | 80                        | 0.018     | 31830                     | 575                        | 0.5                         | 0.4        |
| 0.90       | 80                        | 0.020     | 28295                     | 565                        | 0.5                         | 0.5        |
| 1.00       | 80                        | 0.022     | 25465                     | 560                        | 0.5                         | 0.5        |
| 0.20       | 40                        | 0.003     | 60000                     | 180                        | 0.0                         | 0.3        |
| 0.30       | 40                        | 0.005     | 42440                     | 210                        | 0.0                         | 0.5        |
| 0.40       | 40                        | 0.006     | 31830                     | 190                        | 0.0                         | 0.6        |
| 0.50       | 40                        | 0.008     | 25465                     | 205                        | 0.0                         | 0.8        |
| 0.60       | 40                        | 0.009     | 21220                     | 190                        | 0.0                         | 0.9        |
| 0.70       | 40                        | 0.011     | 18190                     | 200                        | 0.0                         | 1.1        |
| 0.80       | 40                        | 0.012     | 15915                     | 190                        | 0.0                         | 1.3        |
| 0.90       | 40                        | 0.014     | 14145                     | 200                        | 0.0                         | 1.4        |
| 1.00       | 40                        | 0.015     | 12730                     | 190                        | 0.0                         | 1.6        |
| 0.20       | 50                        | 0.004     | 60000                     | 240                        | 0.0                         | 0.3        |
| 0.30       | 50                        | 0.005     | 53050                     | 265                        | 0.0                         | 0.4        |
| 0.40       | 50                        | 0.007     | 39790                     | 280                        | 0.0                         | 0.4        |
| 0.50       | 50                        | 0.009     | 31830                     | 285                        | 0.0                         | 0.5        |
| 0.60       | 50                        | 0.011     | 26525                     | 290                        | 0.0                         | 0.6        |
| 0.70       | 50                        | 0.013     | 22735                     | 295                        | 0.0                         | 0.7        |
| 0.80       | 50                        | 0.015     | 19895                     | 300                        | 0.0                         | 0.8        |
| 0.90       | 50                        | 0.016     | 17685                     | 285                        | 0.0                         | 1.0        |
| 1.00       | 50                        | 0.018     | 15915                     | 285                        | 0.0                         | 1.1        |

## Matières

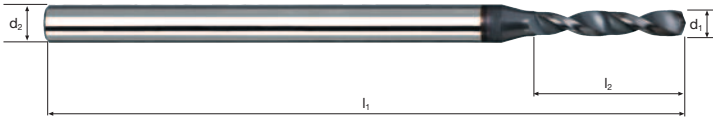
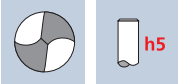
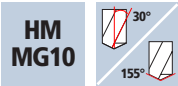
**Fonte**  
grise / sphéroïdale

Aluminium corroyé  
Si < 6%

[illegible]

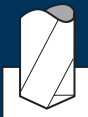
# Microforets    Microdrill NX

5xd



|             |                |                 |  |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|

| Exemple:<br>N° cde     |          |          |    |     |                  | DURO-SD |   |
|------------------------|----------|----------|----|-----|------------------|---------|---|
| N° d'article    Code-ø |          |          |    |     |                  | B57014  |   |
| ø<br>Code              | d1<br>m7 | d2<br>h5 | l1 | l2  | L <sub>max</sub> |         |   |
| .0020                  | 0.20     | 3        | 42 | 1.3 | 1.0              |         | ● |
| .0025                  | 0.25     | 3        | 42 | 1.6 | 1.2              |         | ● |
| .0030                  | 0.30     | 3        | 42 | 2.0 | 1.6              |         | ● |
| .0035                  | 0.35     | 3        | 42 | 2.3 | 1.8              |         | ● |
| .0040                  | 0.40     | 3        | 42 | 2.6 | 2.0              |         | ● |
| .0045                  | 0.45     | 3        | 42 | 2.9 | 2.2              |         | ● |
| .0050                  | 0.50     | 3        | 42 | 3.3 | 2.6              |         | ● |
| .0055                  | 0.55     | 3        | 42 | 3.6 | 2.8              |         | ● |
| .0060                  | 0.60     | 3        | 42 | 3.9 | 3.0              |         | ● |
| .0065                  | 0.65     | 3        | 42 | 4.2 | 3.2              |         | ● |
| .0070                  | 0.70     | 3        | 42 | 4.6 | 3.6              |         | ● |
| .0075                  | 0.75     | 3        | 42 | 4.9 | 3.8              |         | ● |
| .0080                  | 0.80     | 3        | 42 | 5.2 | 4.0              |         | ● |
| .0085                  | 0.85     | 3        | 42 | 5.5 | 4.2              |         | ● |
| .0087                  | 0.87     | 3        | 42 | 5.7 | 4.4              |         | ● |
| .0090                  | 0.90     | 3        | 42 | 5.9 | 4.6              |         | ● |
| .0095                  | 0.95     | 3        | 42 | 6.2 | 4.8              |         | ● |
| .0100                  | 1.00     | 3        | 42 | 6.5 | 5.0              |         | ● |
| .0105                  | 1.05     | 3        | 42 | 6.8 | 5.2              |         | ● |
| .0107                  | 1.07     | 3        | 42 | 7.0 | 5.4              |         | ● |
|                        |          |          |    |     |                  |         |   |
|                        |          |          |    |     |                  |         |   |
|                        |          |          |    |     |                  |         |   |

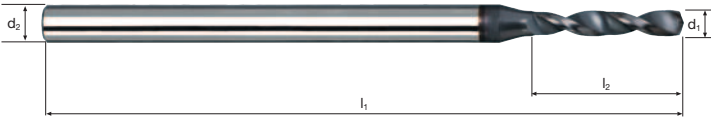
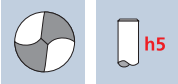
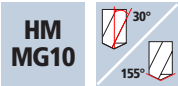
| Application                                                                       | Matières                             | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|--------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm²                | 1.10       | 100                       | 0.022     | 28935                     | 635                        | 0.5                         | 0.5        |
|                                                                                   |                                      | 1.20       | 100                       | 0.024     | 26525                     | 635                        | 0.5                         | 0.6        |
|                                                                                   |                                      | 1.30       | 100                       | 0.026     | 24485                     | 635                        | 1.0                         | 0.6        |
|                                                                                   |                                      | 1.40       | 100                       | 0.028     | 22735                     | 635                        | 1.0                         | 0.7        |
|                                                                                   |                                      | 1.50       | 100                       | 0.030     | 21220                     | 635                        | 1.0                         | 0.7        |
|                                                                                   |                                      | 1.60       | 100                       | 0.032     | 19895                     | 635                        | 1.5                         | 0.8        |
|                                                                                   |                                      | 1.70       | 100                       | 0.034     | 18725                     | 635                        | 1.5                         | 0.8        |
|                                                                                   |                                      | 1.80       | 100                       | 0.036     | 17685                     | 635                        | 1.5                         | 0.9        |
|                                                                                   |                                      | 1.90       | 100                       | 0.038     | 16755                     | 635                        | 2.0                         | 0.9        |
|                                                                                   |                                      |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm²            | 1.10       | 80                        | 0.024     | 23150                     | 555                        | 0.5                         | 0.6        |
|                                                                                   |                                      | 1.20       | 80                        | 0.027     | 21220                     | 575                        | 0.5                         | 0.6        |
|                                                                                   |                                      | 1.30       | 80                        | 0.029     | 19590                     | 570                        | 1.0                         | 0.7        |
|                                                                                   |                                      | 1.40       | 80                        | 0.031     | 18190                     | 565                        | 1.0                         | 0.7        |
|                                                                                   |                                      | 1.50       | 80                        | 0.033     | 16975                     | 560                        | 1.0                         | 0.8        |
|                                                                                   |                                      | 1.60       | 80                        | 0.036     | 15915                     | 575                        | 1.0                         | 0.8        |
|                                                                                   |                                      | 1.70       | 80                        | 0.038     | 14980                     | 570                        | 1.5                         | 0.9        |
|                                                                                   |                                      | 1.80       | 80                        | 0.040     | 14145                     | 565                        | 1.5                         | 1.0        |
|                                                                                   |                                      | 1.90       | 80                        | 0.042     | 13405                     | 565                        | 1.5                         | 1.0        |
|                                                                                   |                                      |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm²           | 1.10       | 40                        | 0.017     | 11575                     | 195                        | 0.0                         | 1.7        |
|                                                                                   |                                      | 1.20       | 40                        | 0.018     | 10610                     | 190                        | 0.0                         | 1.9        |
|                                                                                   |                                      | 1.30       | 40                        | 0.020     | 9795                      | 195                        | 0.5                         | 2.0        |
|                                                                                   |                                      | 1.40       | 40                        | 0.022     | 9095                      | 200                        | 0.5                         | 2.1        |
|                                                                                   |                                      | 1.50       | 40                        | 0.023     | 8490                      | 195                        | 0.5                         | 2.3        |
|                                                                                   |                                      | 1.60       | 40                        | 0.025     | 7960                      | 200                        | 0.5                         | 2.4        |
|                                                                                   |                                      | 1.70       | 40                        | 0.026     | 7490                      | 195                        | 0.5                         | 2.6        |
|                                                                                   |                                      | 1.80       | 40                        | 0.028     | 7075                      | 200                        | 0.5                         | 2.7        |
|                                                                                   |                                      | 1.90       | 40                        | 0.029     | 6700                      | 195                        | 0.5                         | 3.0        |
|                                                                                   |                                      |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers inoxydables<br>[Cr-Ni/1.4301] | 1.10       | 30                        | 0.017     | 8680                      | 150                        | 0.0                         | 2.2        |
|                                                                                   |                                      | 1.20       | 30                        | 0.018     | 7960                      | 145                        | 0.0                         | 2.5        |
|                                                                                   |                                      | 1.30       | 30                        | 0.020     | 7345                      | 145                        | 0.0                         | 2.7        |
|                                                                                   |                                      | 1.40       | 30                        | 0.022     | 6820                      | 150                        | 0.0                         | 2.8        |
|                                                                                   |                                      | 1.50       | 30                        | 0.023     | 6365                      | 145                        | 0.5                         | 3.1        |
|                                                                                   |                                      | 1.60       | 30                        | 0.025     | 5970                      | 150                        | 0.5                         | 3.2        |
|                                                                                   |                                      | 1.70       | 30                        | 0.026     | 5615                      | 145                        | 0.5                         | 3.6        |
|                                                                                   |                                      | 1.80       | 30                        | 0.028     | 5305                      | 150                        | 0.5                         | 3.6        |
|                                                                                   |                                      | 1.90       | 30                        | 0.029     | 5025                      | 145                        | 0.5                         | 4.0        |
|                                                                                   |                                      |            |                           |           |                           |                            |                             |            |

| Matières                     | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| Fonte<br>grise / sphéroïdale | 1.10       | 130                       | 0.024     | 37620                     | 905                        | 1.0                         | 0.4        |
|                              | 1.20       | 130                       | 0.027     | 34485                     | 930                        | 1.0                         | 0.4        |
|                              | 1.30       | 130                       | 0.029     | 31830                     | 925                        | 1.0                         | 0.4        |
|                              | 1.40       | 130                       | 0.031     | 29555                     | 915                        | 1.5                         | 0.5        |
|                              | 1.50       | 130                       | 0.033     | 27585                     | 910                        | 1.5                         | 0.5        |
|                              | 1.60       | 130                       | 0.036     | 25865                     | 930                        | 2.0                         | 0.5        |
|                              | 1.70       | 130                       | 0.038     | 24340                     | 925                        | 2.0                         | 0.6        |
|                              | 1.80       | 130                       | 0.040     | 22990                     | 920                        | 2.5                         | 0.6        |
|                              | 1.90       | 130                       | 0.042     | 21780                     | 915                        | 2.5                         | 0.6        |
|                              |            |                           |           |                           |                            |                             |            |
| Aluminium corroyé<br>Si < 6% | 1.10       | 160                       | 0.024     | 46300                     | 1110                       | 1.0                         | 0.3        |
|                              | 1.20       | 160                       | 0.027     | 42440                     | 1145                       | 1.5                         | 0.3        |
|                              | 1.30       | 160                       | 0.029     | 39175                     | 1135                       | 1.5                         | 0.3        |
|                              | 1.40       | 160                       | 0.031     | 36380                     | 1130                       | 1.5                         | 0.4        |
|                              | 1.50       | 160                       | 0.033     | 33955                     | 1120                       | 2.0                         | 0.4        |
|                              | 1.60       | 160                       | 0.036     | 31830                     | 1145                       | 2.5                         | 0.4        |
|                              | 1.70       | 160                       | 0.038     | 29960                     | 1140                       | 2.5                         | 0.5        |
|                              | 1.80       | 160                       | 0.040     | 28295                     | 1130                       | 3.0                         | 0.5        |
|                              | 1.90       | 160                       | 0.042     | 26805                     | 1125                       | 3.0                         | 0.5        |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |
|                              |            |                           |           |                           |                            |                             |            |



# Microforets    Microdrill NX

5xd



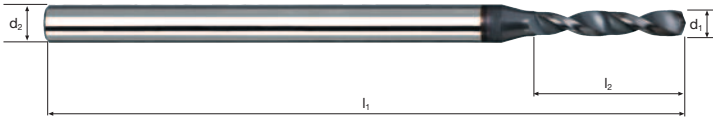
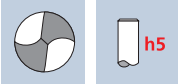
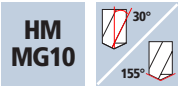
|             |                |                 |  |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|

| Exemple:<br>N° cde     |          |          |    |      |                  | DURO-SD |   |
|------------------------|----------|----------|----|------|------------------|---------|---|
| N° d'article    Code-ø |          |          |    |      |                  | B57014  |   |
| ø<br>Code              | d1<br>m7 | d2<br>h5 | l1 | l2   | L <sub>max</sub> |         |   |
| .0110                  | 1.10     | 3        | 42 | 7.2  | 5.6              |         | ● |
| .0115                  | 1.15     | 3        | 42 | 7.5  | 5.8              |         | ● |
| .0120                  | 1.20     | 3        | 42 | 7.8  | 6.0              |         | ● |
| .0125                  | 1.25     | 3        | 42 | 8.1  | 6.2              |         | ● |
| .0130                  | 1.30     | 3        | 42 | 8.5  | 6.6              |         | ● |
| .0135                  | 1.35     | 3        | 42 | 8.8  | 6.8              |         | ● |
| .0140                  | 1.40     | 3        | 42 | 9.1  | 7.0              |         | ● |
| .0142                  | 1.42     | 3        | 42 | 9.2  | 7.1              |         | ● |
| .0145                  | 1.45     | 3        | 42 | 9.4  | 7.2              |         | ● |
| .0150                  | 1.50     | 3        | 42 | 9.8  | 7.6              |         | ● |
| .0155                  | 1.55     | 3        | 42 | 10.1 | 7.8              |         | ● |
| .0160                  | 1.60     | 3        | 42 | 10.4 | 8.0              |         | ● |
| .0162                  | 1.62     | 3        | 42 | 10.5 | 8.1              |         | ● |
| .0165                  | 1.65     | 3        | 42 | 10.7 | 8.2              |         | ● |
| .0170                  | 1.70     | 3        | 42 | 11.1 | 8.6              |         | ● |
| .0175                  | 1.75     | 3        | 42 | 11.4 | 8.8              |         | ● |
| .0180                  | 1.80     | 3        | 42 | 11.7 | 9.0              |         | ● |
| .0185                  | 1.85     | 3        | 50 | 12.0 | 9.2              |         | ● |
| .0190                  | 1.90     | 3        | 50 | 12.4 | 9.6              |         | ● |
| .0195                  | 1.95     | 3        | 50 | 12.7 | 9.8              |         | ● |
|                        |          |          |    |      |                  |         |   |
|                        |          |          |    |      |                  |         |   |
|                        |          |          |    |      |                  |         |   |

| Application                                                                       | Matières                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|----------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>      | 2.00       | 100                       | 0.040     | 15915                     | 635                        | 2.0                         | 0.9        |
|                                                                                   |                                        | 2.10       | 100                       | 0.042     | 15160                     | 635                        | 2.0                         | 1.0        |
|                                                                                   |                                        | 2.20       | 100                       | 0.044     | 14470                     | 635                        | 2.5                         | 1.0        |
|                                                                                   |                                        | 2.35       | 100                       | 0.047     | 13545                     | 635                        | 3.0                         | 1.1        |
|                                                                                   |                                        | 2.50       | 100                       | 0.050     | 12730                     | 635                        | 3.0                         | 1.2        |
|                                                                                   |                                        | 2.60       | 100                       | 0.052     | 12245                     | 635                        | 3.5                         | 1.2        |
|                                                                                   |                                        | 2.75       | 100                       | 0.055     | 11575                     | 635                        | 4.0                         | 1.3        |
|                                                                                   |                                        | 2.85       | 100                       | 0.057     | 11170                     | 635                        | 4.0                         | 1.3        |
|                                                                                   |                                        | 2.95       | 100                       | 0.059     | 10790                     | 635                        | 4.5                         | 1.4        |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm <sup>2</sup>  | 2.00       | 80                        | 0.044     | 12730                     | 560                        | 2.0                         | 1.1        |
|                                                                                   |                                        | 2.10       | 80                        | 0.047     | 12125                     | 570                        | 2.0                         | 1.1        |
|                                                                                   |                                        | 2.20       | 80                        | 0.049     | 11575                     | 565                        | 2.0                         | 1.2        |
|                                                                                   |                                        | 2.35       | 80                        | 0.052     | 10835                     | 565                        | 2.5                         | 1.3        |
|                                                                                   |                                        | 2.50       | 80                        | 0.056     | 10185                     | 570                        | 3.0                         | 1.3        |
|                                                                                   |                                        | 2.60       | 80                        | 0.058     | 9795                      | 570                        | 3.0                         | 1.4        |
|                                                                                   |                                        | 2.75       | 80                        | 0.061     | 9260                      | 565                        | 3.5                         | 1.5        |
|                                                                                   |                                        | 2.85       | 80                        | 0.063     | 8935                      | 565                        | 3.5                         | 1.5        |
|                                                                                   |                                        | 2.95       | 80                        | 0.066     | 8630                      | 570                        | 4.0                         | 1.6        |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm <sup>2</sup> | 2.00       | 40                        | 0.031     | 6365                      | 195                        | 0.5                         | 3.1        |
|                                                                                   |                                        | 2.10       | 40                        | 0.032     | 6065                      | 195                        | 0.5                         | 3.2        |
|                                                                                   |                                        | 2.20       | 40                        | 0.034     | 5785                      | 195                        | 0.5                         | 3.4        |
|                                                                                   |                                        | 2.35       | 40                        | 0.036     | 5420                      | 195                        | 1.0                         | 3.6        |
|                                                                                   |                                        | 2.50       | 40                        | 0.038     | 5095                      | 195                        | 1.0                         | 3.9        |
|                                                                                   |                                        | 2.60       | 40                        | 0.040     | 4895                      | 195                        | 1.0                         | 4.0        |
|                                                                                   |                                        | 2.75       | 40                        | 0.042     | 4630                      | 195                        | 1.0                         | 4.2        |
|                                                                                   |                                        | 2.85       | 40                        | 0.044     | 4470                      | 195                        | 1.0                         | 4.4        |
|                                                                                   |                                        | 2.95       | 40                        | 0.045     | 4315                      | 195                        | 1.5                         | 4.6        |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers inoxydables<br>[Cr-Ni/1.4301]   | 2.00       | 30                        | 0.031     | 4775                      | 150                        | 0.5                         | 4.0        |
|                                                                                   |                                        | 2.10       | 30                        | 0.032     | 4545                      | 145                        | 0.5                         | 4.3        |
|                                                                                   |                                        | 2.20       | 30                        | 0.034     | 4340                      | 150                        | 0.5                         | 4.4        |
|                                                                                   |                                        | 2.35       | 30                        | 0.036     | 4065                      | 145                        | 0.5                         | 4.9        |
|                                                                                   |                                        | 2.50       | 30                        | 0.038     | 3820                      | 145                        | 0.5                         | 5.2        |
|                                                                                   |                                        | 2.60       | 30                        | 0.040     | 3675                      | 145                        | 1.0                         | 5.4        |
|                                                                                   |                                        | 2.75       | 30                        | 0.042     | 3470                      | 145                        | 1.0                         | 5.7        |
|                                                                                   |                                        | 2.85       | 30                        | 0.044     | 3350                      | 145                        | 1.0                         | 5.9        |
|                                                                                   |                                        | 2.95       | 30                        | 0.045     | 3235                      | 145                        | 1.0                         | 6.1        |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   | Matières                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|                                                                                   | Fonte<br>grise / sphéroïdale           | 2.00       | 130                       | 0.044     | 20690                     | 910                        | 3.0                         | 0.7        |
|                                                                                   |                                        | 2.10       | 130                       | 0.047     | 19705                     | 925                        | 3.0                         | 0.7        |
|                                                                                   |                                        | 2.20       | 130                       | 0.049     | 18810                     | 920                        | 3.5                         | 0.7        |
|                                                                                   |                                        | 2.35       | 130                       | 0.052     | 17610                     | 915                        | 4.0                         | 0.8        |
|                                                                                   |                                        | 2.50       | 130                       | 0.056     | 16550                     | 925                        | 4.5                         | 0.8        |
|                                                                                   |                                        | 2.60       | 130                       | 0.058     | 15915                     | 925                        | 5.0                         | 0.8        |
|                                                                                   |                                        | 2.75       | 130                       | 0.061     | 15045                     | 920                        | 5.5                         | 0.9        |
|                                                                                   |                                        | 2.85       | 130                       | 0.063     | 14520                     | 915                        | 6.0                         | 0.9        |
|                                                                                   |                                        | 2.95       | 130                       | 0.066     | 14025                     | 925                        | 6.5                         | 1.0        |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aluminium corroyé<br>Si < 6%           | 2.00       | 160                       | 0.044     | 25465                     | 1120                       | 3.5                         | 0.5        |
|                                                                                   |                                        | 2.10       | 160                       | 0.047     | 24250                     | 1140                       | 4.0                         | 0.6        |
|                                                                                   |                                        | 2.20       | 160                       | 0.049     | 23150                     | 1135                       | 4.5                         | 0.6        |
|                                                                                   |                                        | 2.35       | 160                       | 0.052     | 21670                     | 1125                       | 5.0                         | 0.6        |
|                                                                                   |                                        | 2.50       | 160                       | 0.056     | 20370                     | 1140                       | 5.5                         | 0.7        |
|                                                                                   |                                        | 2.60       | 160                       | 0.058     | 19590                     | 1135                       | 6.0                         | 0.7        |
|                                                                                   |                                        | 2.75       | 160                       | 0.061     | 18520                     | 1130                       | 6.5                         | 0.7        |
|                                                                                   |                                        | 2.85       | 160                       | 0.063     | 17870                     | 1125                       | 7.0                         | 0.8        |
|                                                                                   |                                        | 2.95       | 160                       | 0.066     | 17265                     | 1140                       | 8.0                         | 0.8        |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                        |            |                           |           |                           |                            |                             |            |

# Microforets    Microdrill NX

5xd



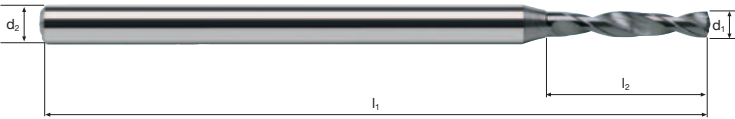
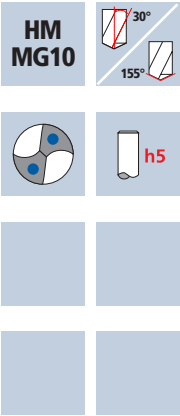
|             |                |                 |  |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|

| Exemple:<br>N° cde     |          |          |    |      |                  |  | DURO-SD |  |
|------------------------|----------|----------|----|------|------------------|--|---------|--|
| N° d'article    Code-ø |          |          |    |      |                  |  | B57014  |  |
| ø<br>Code              | d1<br>m7 | d2<br>h5 | l1 | l2   | L <sub>max</sub> |  |         |  |
| .0200                  | 2.00     | 3        | 50 | 13.0 | 10.0             |  | ●       |  |
| .0205                  | 2.05     | 3        | 50 | 13.3 | 10.2             |  | ●       |  |
| .0210                  | 2.10     | 3        | 50 | 13.7 | 10.6             |  | ●       |  |
| .0215                  | 2.15     | 3        | 50 | 14.0 | 10.8             |  | ●       |  |
| .0220                  | 2.20     | 3        | 50 | 14.3 | 11.0             |  | ●       |  |
| .0225                  | 2.25     | 3        | 50 | 14.6 | 11.2             |  | ●       |  |
| .0230                  | 2.30     | 3        | 50 | 15.0 | 11.6             |  | ●       |  |
| .0235                  | 2.35     | 3        | 50 | 15.3 | 11.8             |  | ●       |  |
| .0240                  | 2.40     | 3        | 50 | 15.6 | 12.0             |  | ●       |  |
| .0245                  | 2.45     | 3        | 50 | 15.9 | 12.2             |  | ●       |  |
| .0250                  | 2.50     | 3        | 50 | 16.3 | 12.6             |  | ●       |  |
| .0255                  | 2.55     | 3        | 50 | 16.6 | 12.8             |  | ●       |  |
| .0260                  | 2.60     | 3        | 50 | 16.9 | 13.0             |  | ●       |  |
| .0265                  | 2.65     | 3        | 50 | 17.2 | 13.2             |  | ●       |  |
| .0270                  | 2.70     | 3        | 50 | 17.6 | 13.6             |  | ●       |  |
| .0275                  | 2.75     | 3        | 50 | 17.9 | 13.8             |  | ●       |  |
| .0280                  | 2.80     | 3        | 50 | 18.2 | 14.0             |  | ●       |  |
| .0285                  | 2.85     | 3        | 50 | 18.5 | 14.2             |  | ●       |  |
| .0290                  | 2.90     | 3        | 50 | 18.9 | 14.6             |  | ●       |  |
| .0295                  | 2.95     | 3        | 50 | 19.2 | 14.8             |  | ●       |  |
|                        |          |          |    |      |                  |  |         |  |
|                        |          |          |    |      |                  |  |         |  |
|                        |          |          |    |      |                  |  |         |  |

| Application                                                                       | Matières                                | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>       | 0.80       | 160                       | 0.018     | 60000                     | 1080                       | 0.5                         | 0.2        |
|                                                                                   |                                         | 0.90       | 160                       | 0.020     | 56590                     | 1130                       | 0.5                         | 0.2        |
|                                                                                   |                                         | 1.00       | 160                       | 0.022     | 50930                     | 1120                       | 1.0                         | 0.3        |
|                                                                                   |                                         | 1.10       | 160                       | 0.024     | 46300                     | 1110                       | 1.0                         | 0.3        |
|                                                                                   |                                         | 1.25       | 160                       | 0.028     | 40745                     | 1140                       | 1.5                         | 0.3        |
|                                                                                   |                                         | 1.40       | 160                       | 0.032     | 36380                     | 1165                       | 2.0                         | 0.4        |
|                                                                                   |                                         | 1.50       | 160                       | 0.034     | 33955                     | 1155                       | 2.0                         | 0.4        |
|                                                                                   |                                         | 1.65       | 160                       | 0.039     | 30865                     | 1205                       | 2.5                         | 0.4        |
|                                                                                   |                                         | 1.80       | 160                       | 0.044     | 28295                     | 1245                       | 3.0                         | 0.4        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm <sup>2</sup>   | 0.80       | 120                       | 0.018     | 47745                     | 860                        | 0.5                         | 0.3        |
|                                                                                   |                                         | 0.90       | 120                       | 0.020     | 42440                     | 850                        | 0.5                         | 0.3        |
|                                                                                   |                                         | 1.00       | 120                       | 0.022     | 38195                     | 840                        | 0.5                         | 0.4        |
|                                                                                   |                                         | 1.10       | 120                       | 0.024     | 34725                     | 835                        | 1.0                         | 0.4        |
|                                                                                   |                                         | 1.25       | 120                       | 0.028     | 30560                     | 855                        | 1.0                         | 0.4        |
|                                                                                   |                                         | 1.40       | 120                       | 0.032     | 27285                     | 875                        | 1.5                         | 0.5        |
|                                                                                   |                                         | 1.50       | 120                       | 0.034     | 25465                     | 865                        | 1.5                         | 0.5        |
|                                                                                   |                                         | 1.65       | 120                       | 0.039     | 23150                     | 905                        | 2.0                         | 0.5        |
|                                                                                   |                                         | 1.80       | 120                       | 0.044     | 21220                     | 935                        | 2.5                         | 0.6        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | 0.80       | 100                       | 0.018     | 39790                     | 715                        | 0.5                         | 0.3        |
|                                                                                   |                                         | 0.90       | 100                       | 0.020     | 35370                     | 705                        | 0.5                         | 0.4        |
|                                                                                   |                                         | 1.00       | 100                       | 0.022     | 31830                     | 700                        | 0.5                         | 0.4        |
|                                                                                   |                                         | 1.10       | 100                       | 0.024     | 28935                     | 695                        | 0.5                         | 0.5        |
|                                                                                   |                                         | 1.25       | 100                       | 0.028     | 25465                     | 715                        | 1.0                         | 0.5        |
|                                                                                   |                                         | 1.40       | 100                       | 0.032     | 22735                     | 730                        | 1.0                         | 0.6        |
|                                                                                   |                                         | 1.50       | 100                       | 0.034     | 21220                     | 720                        | 1.5                         | 0.6        |
|                                                                                   |                                         | 1.65       | 100                       | 0.039     | 19290                     | 750                        | 1.5                         | 0.7        |
|                                                                                   |                                         | 1.80       | 100                       | 0.044     | 17685                     | 780                        | 2.0                         | 0.7        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers inoxydables<br>[Cr-Ni-Mo/1.4571] | 0.80       | 70                        | 0.014     | 27850                     | 390                        | 0.0                         | 0.6        |
|                                                                                   |                                         | 0.90       | 70                        | 0.016     | 24755                     | 395                        | 0.5                         | 0.7        |
|                                                                                   |                                         | 1.00       | 70                        | 0.018     | 22280                     | 400                        | 0.5                         | 0.8        |
|                                                                                   |                                         | 1.10       | 70                        | 0.020     | 20255                     | 405                        | 0.5                         | 0.8        |
|                                                                                   |                                         | 1.25       | 70                        | 0.023     | 17825                     | 410                        | 0.5                         | 0.9        |
|                                                                                   |                                         | 1.40       | 70                        | 0.026     | 15915                     | 415                        | 0.5                         | 1.0        |
|                                                                                   |                                         | 1.50       | 70                        | 0.029     | 14855                     | 430                        | 1.0                         | 1.1        |
|                                                                                   |                                         | 1.65       | 70                        | 0.032     | 13505                     | 430                        | 1.0                         | 1.1        |
|                                                                                   |                                         | 1.80       | 70                        | 0.036     | 12380                     | 445                        | 1.0                         | 1.2        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
| Matières                                                                          |                                         | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
| Fonte<br>grise / sphéroïdale                                                      |                                         | 0.80       | 200                       | 0.021     | 60000                     | 1260                       | 0.5                         | 0.2        |
|                                                                                   |                                         | 0.90       | 200                       | 0.023     | 60000                     | 1380                       | 1.0                         | 0.2        |
|                                                                                   |                                         | 1.00       | 200                       | 0.026     | 60000                     | 1560                       | 1.0                         | 0.2        |
|                                                                                   |                                         | 1.10       | 200                       | 0.028     | 57875                     | 1620                       | 1.5                         | 0.2        |
|                                                                                   |                                         | 1.25       | 200                       | 0.033     | 50930                     | 1680                       | 2.0                         | 0.2        |
|                                                                                   |                                         | 1.40       | 200                       | 0.037     | 45475                     | 1685                       | 2.5                         | 0.2        |
|                                                                                   |                                         | 1.50       | 200                       | 0.041     | 42440                     | 1740                       | 3.0                         | 0.3        |
|                                                                                   |                                         | 1.65       | 200                       | 0.045     | 38585                     | 1735                       | 3.5                         | 0.3        |
|                                                                                   |                                         | 1.80       | 200                       | 0.050     | 35370                     | 1770                       | 4.5                         | 0.3        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
| Aluminium corroyé<br>Si < 6%                                                      |                                         | 0.80       | 250                       | 0.021     | 60000                     | 1260                       | 0.5                         | 0.2        |
|                                                                                   |                                         | 0.90       | 250                       | 0.023     | 60000                     | 1380                       | 1.0                         | 0.2        |
|                                                                                   |                                         | 1.00       | 250                       | 0.026     | 60000                     | 1560                       | 1.0                         | 0.2        |
|                                                                                   |                                         | 1.10       | 250                       | 0.028     | 60000                     | 1680                       | 1.5                         | 0.2        |
|                                                                                   |                                         | 1.25       | 250                       | 0.033     | 60000                     | 1980                       | 2.5                         | 0.2        |
|                                                                                   |                                         | 1.40       | 250                       | 0.037     | 56840                     | 2105                       | 3.0                         | 0.2        |
|                                                                                   |                                         | 1.50       | 250                       | 0.041     | 53050                     | 2175                       | 4.0                         | 0.2        |
|                                                                                   |                                         | 1.65       | 250                       | 0.045     | 48230                     | 2170                       | 4.5                         | 0.2        |
|                                                                                   |                                         | 1.80       | 250                       | 0.050     | 44210                     | 2210                       | 5.5                         | 0.2        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |

Microforets    Microdrill NX

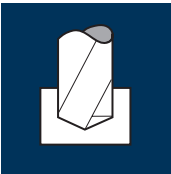
5xd



|             |                |                 |  |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|

| Exemple: N° cde        |          |          |    |      |                  | DURO-SD |   |
|------------------------|----------|----------|----|------|------------------|---------|---|
| N° d'article<br>B57015 |          |          |    |      |                  | B57015  |   |
| Code-ø<br>.0080        |          |          |    |      |                  |         |   |
| ø<br>Code              | d1<br>m7 | d2<br>h5 | l1 | l2   | L <sub>max</sub> |         |   |
| new! .0080             | 0.80     | 3        | 46 | 5.2  | 4.0              |         | ● |
| new! .0085             | 0.85     | 3        | 46 | 5.5  | 4.2              |         | ● |
| new! .0090             | 0.90     | 3        | 46 | 5.9  | 4.6              |         | ● |
| new! .0095             | 0.95     | 3        | 46 | 6.2  | 4.8              |         | ● |
| new! .0100             | 1.00     | 3        | 48 | 6.5  | 5.0              |         | ● |
| new! .0105             | 1.05     | 3        | 48 | 6.8  | 5.2              |         | ● |
| new! .0110             | 1.10     | 3        | 48 | 7.2  | 5.6              |         | ● |
| new! .0115             | 1.15     | 3        | 48 | 7.5  | 5.8              |         | ● |
| new! .0120             | 1.20     | 3        | 48 | 7.8  | 6.0              |         | ● |
| new! .0125             | 1.25     | 3        | 48 | 8.1  | 6.2              |         | ● |
| new! .0130             | 1.30     | 3        | 48 | 8.5  | 6.6              |         | ● |
| new! .0135             | 1.35     | 3        | 48 | 8.8  | 6.8              |         | ● |
| new! .0140             | 1.40     | 3        | 50 | 9.1  | 7.0              |         | ● |
| new! .0145             | 1.45     | 3        | 50 | 9.4  | 7.2              |         | ● |
| new! .0150             | 1.50     | 3        | 50 | 9.8  | 7.6              |         | ● |
| new! .0155             | 1.55     | 3        | 50 | 10.1 | 7.8              |         | ● |
| new! .0160             | 1.60     | 3        | 50 | 10.4 | 8.0              |         | ● |
| new! .0165             | 1.65     | 3        | 50 | 10.7 | 8.2              |         | ● |
| new! .0170             | 1.70     | 3        | 52 | 11.1 | 8.6              |         | ● |
| new! .0175             | 1.75     | 3        | 52 | 11.4 | 8.8              |         | ● |
| new! .0180             | 1.80     | 3        | 52 | 11.7 | 9.0              |         | ● |
| new! .0185             | 1.85     | 3        | 52 | 12.0 | 9.2              |         | ● |
|                        |          |          |    |      |                  |         |   |

## Application



## Matières

**Aciers**  
**< 500 N/mm<sup>2</sup>**

**Aciers**  
500 - 850 N/mm<sup>2</sup>

**Aciers**  
850 - 1100 N/mm<sup>2</sup>

**Aciers inoxydables  
[Cr-Ni-Mo/1.4571]**

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 2.00       | 160                       | 0.049     | 25465                     | 1250                       | 4.0                         | 0.5        |
| 2.10       | 160                       | 0.051     | 24250                     | 1235                       | 4.5                         | 0.5        |
| 2.20       | 160                       | 0.054     | 23150                     | 1250                       | 5.0                         | 0.5        |
| 2.35       | 160                       | 0.059     | 21670                     | 1280                       | 5.5                         | 0.6        |
| 2.50       | 160                       | 0.064     | 20370                     | 1305                       | 6.5                         | 0.6        |
| 2.60       | 160                       | 0.067     | 19590                     | 1315                       | 7.0                         | 0.6        |
| 2.75       | 160                       | 0.072     | 18520                     | 1335                       | 8.0                         | 0.6        |
| 2.85       | 160                       | 0.075     | 17870                     | 1340                       | 8.5                         | 0.6        |
| 2.95       | 160                       | 0.080     | 17265                     | 1380                       | 9.5                         | 0.6        |
| 2.00       | 120                       | 0.049     | 19100                     | 935                        | 3.0                         | 0.6        |
| 2.10       | 120                       | 0.051     | 18190                     | 930                        | 3.0                         | 0.7        |
| 2.20       | 120                       | 0.054     | 17360                     | 935                        | 3.5                         | 0.7        |
| 2.35       | 120                       | 0.059     | 16255                     | 960                        | 4.0                         | 0.7        |
| 2.50       | 120                       | 0.064     | 15280                     | 980                        | 5.0                         | 0.8        |
| 2.60       | 120                       | 0.067     | 14690                     | 985                        | 5.0                         | 0.8        |
| 2.75       | 120                       | 0.072     | 13890                     | 1000                       | 6.0                         | 0.8        |
| 2.85       | 120                       | 0.075     | 13405                     | 1005                       | 6.5                         | 0.8        |
| 2.95       | 120                       | 0.080     | 12950                     | 1035                       | 7.0                         | 0.9        |
| 2.00       | 100                       | 0.049     | 15915                     | 780                        | 2.5                         | 0.8        |
| 2.10       | 100                       | 0.051     | 15160                     | 775                        | 2.5                         | 0.8        |
| 2.20       | 100                       | 0.054     | 14470                     | 780                        | 3.0                         | 0.8        |
| 2.35       | 100                       | 0.059     | 13545                     | 800                        | 3.5                         | 0.9        |
| 2.50       | 100                       | 0.064     | 12730                     | 815                        | 4.0                         | 0.9        |
| 2.60       | 100                       | 0.067     | 12245                     | 820                        | 4.5                         | 1.0        |
| 2.75       | 100                       | 0.072     | 11575                     | 835                        | 5.0                         | 1.0        |
| 2.85       | 100                       | 0.075     | 11170                     | 840                        | 5.5                         | 1.0        |
| 2.95       | 100                       | 0.080     | 10790                     | 865                        | 6.0                         | 1.0        |
| 2.00       | 70                        | 0.045     | 11140                     | 500                        | 1.5                         | 1.2        |
| 2.10       | 70                        | 0.048     | 10610                     | 510                        | 2.0                         | 1.2        |
| 2.20       | 70                        | 0.050     | 10130                     | 505                        | 2.0                         | 1.3        |
| 2.35       | 70                        | 0.055     | 9480                      | 520                        | 2.5                         | 1.4        |
| 2.50       | 70                        | 0.058     | 8915                      | 515                        | 2.5                         | 1.5        |
| 2.60       | 70                        | 0.062     | 8570                      | 530                        | 3.0                         | 1.5        |
| 2.75       | 70                        | 0.067     | 8100                      | 545                        | 3.0                         | 1.5        |
| 2.85       | 70                        | 0.071     | 7820                      | 555                        | 3.5                         | 1.5        |
| 2.95       | 70                        | 0.074     | 7555                      | 560                        | 4.0                         | 1.6        |

## Matières

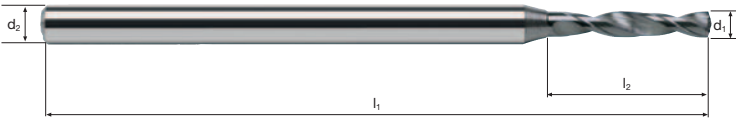
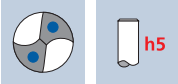
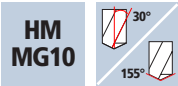
**Fonte**  
grise / sphéroïdale

Aluminium corroyé  
Si < 6%

[illegible]

# Microforets    Microdrill NX

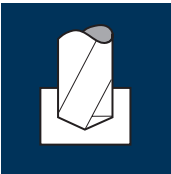
5xd



|             |                |                 |  |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|

| Exemple: N° cde        |          |          |    |      |                  | DURO-SD |   |
|------------------------|----------|----------|----|------|------------------|---------|---|
| N° d'article<br>B57015 |          |          |    |      |                  | B57015  |   |
| Code-ø<br>.0190        |          |          |    |      |                  |         |   |
| ø<br>Code              | d1<br>m7 | d2<br>h5 | l1 | l2   | L <sub>max</sub> |         |   |
| new!<br>.0190          | 1.90     | 3        | 52 | 12.4 | 9.6              |         | ● |
| new!<br>.0195          | 1.95     | 3        | 52 | 12.7 | 9.8              |         | ● |
| .0200                  | 2.00     | 3        | 56 | 13.0 | 10.0             |         | ● |
| .0205                  | 2.05     | 3        | 56 | 13.3 | 10.2             |         | ● |
| .0210                  | 2.10     | 3        | 56 | 13.7 | 10.6             |         | ● |
| .0215                  | 2.15     | 3        | 56 | 14.0 | 10.8             |         | ● |
| .0220                  | 2.20     | 3        | 56 | 14.3 | 11.0             |         | ● |
| .0225                  | 2.25     | 3        | 56 | 14.6 | 11.2             |         | ● |
| .0230                  | 2.30     | 3        | 56 | 15.0 | 11.6             |         | ● |
| .0235                  | 2.35     | 3        | 56 | 15.3 | 11.8             |         | ● |
| .0240                  | 2.40     | 3        | 56 | 15.6 | 12.0             |         | ● |
| .0245                  | 2.45     | 3        | 56 | 15.9 | 12.2             |         | ● |
| .0250                  | 2.50     | 3        | 56 | 16.3 | 12.6             |         | ● |
| .0255                  | 2.55     | 3        | 60 | 16.6 | 12.8             |         | ● |
| .0260                  | 2.60     | 3        | 60 | 16.9 | 13.0             |         | ● |
| .0265                  | 2.65     | 3        | 60 | 17.2 | 13.2             |         | ● |
| .0270                  | 2.70     | 3        | 60 | 17.6 | 13.6             |         | ● |
| .0275                  | 2.75     | 3        | 60 | 17.9 | 13.8             |         | ● |
| .0280                  | 2.80     | 3        | 60 | 18.2 | 14.0             |         | ● |
| .0285                  | 2.85     | 3        | 60 | 18.5 | 14.2             |         | ● |
| .0290                  | 2.90     | 3        | 60 | 18.9 | 14.6             |         | ● |
| .0295                  | 2.95     | 3        | 60 | 19.2 | 14.8             |         | ● |
|                        |          |          |    |      |                  |         |   |

## Application



## Matières

**Aciers**  
**< 500 N/mm<sup>2</sup>**

**Aciers**  
500 - 850 N/mm<sup>2</sup>

**Aciers**  
850 - 1100 N/mm<sup>2</sup>

**Aciers inoxydables  
[Cr-Ni-Mo/1.4571]**

| d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
| 0.80       | 140                       | 0.014     | 55705                     | 780                        | 0.5                         | 0.5        |
| 0.90       | 140                       | 0.016     | 49515                     | 790                        | 0.5                         | 0.5        |
| 1.00       | 140                       | 0.018     | 44565                     | 800                        | 0.5                         | 0.6        |
| 1.10       | 140                       | 0.019     | 40510                     | 770                        | 0.5                         | 0.7        |
| 1.25       | 140                       | 0.023     | 35650                     | 820                        | 1.0                         | 0.7        |
| 1.40       | 140                       | 0.026     | 31830                     | 830                        | 1.5                         | 0.8        |
| 1.50       | 140                       | 0.028     | 29710                     | 830                        | 1.5                         | 0.9        |
| 1.65       | 140                       | 0.032     | 27010                     | 865                        | 2.0                         | 0.9        |
| 1.80       | 140                       | 0.035     | 24755                     | 865                        | 2.0                         | 1.0        |
| 0.80       | 100                       | 0.014     | 39790                     | 555                        | 0.5                         | 0.7        |
| 0.90       | 100                       | 0.016     | 35370                     | 565                        | 0.5                         | 0.8        |
| 1.00       | 100                       | 0.018     | 31830                     | 575                        | 0.5                         | 0.8        |
| 1.10       | 100                       | 0.019     | 28935                     | 550                        | 0.5                         | 1.0        |
| 1.25       | 100                       | 0.023     | 25465                     | 585                        | 0.5                         | 1.0        |
| 1.40       | 100                       | 0.026     | 22735                     | 590                        | 1.0                         | 1.1        |
| 1.50       | 100                       | 0.028     | 21220                     | 595                        | 1.0                         | 1.2        |
| 1.65       | 100                       | 0.032     | 19290                     | 615                        | 1.5                         | 1.3        |
| 1.80       | 100                       | 0.035     | 17685                     | 620                        | 1.5                         | 1.4        |
| 0.80       | 80                        | 0.014     | 31830                     | 445                        | 0.0                         | 0.9        |
| 0.90       | 80                        | 0.016     | 28295                     | 455                        | 0.5                         | 0.9        |
| 1.00       | 80                        | 0.018     | 25465                     | 460                        | 0.5                         | 1.0        |
| 1.10       | 80                        | 0.019     | 23150                     | 440                        | 0.5                         | 1.2        |
| 1.25       | 80                        | 0.023     | 20370                     | 470                        | 0.5                         | 1.3        |
| 1.40       | 80                        | 0.026     | 18190                     | 475                        | 0.5                         | 1.4        |
| 1.50       | 80                        | 0.028     | 16975                     | 475                        | 1.0                         | 1.5        |
| 1.65       | 80                        | 0.032     | 15435                     | 495                        | 1.0                         | 1.6        |
| 1.80       | 80                        | 0.035     | 14145                     | 495                        | 1.5                         | 1.7        |
| 0.80       | 60                        | 0.012     | 23875                     | 285                        | 0.0                         | 1.3        |
| 0.90       | 60                        | 0.013     | 21220                     | 275                        | 0.0                         | 1.6        |
| 1.00       | 60                        | 0.014     | 19100                     | 265                        | 0.0                         | 1.8        |
| 1.10       | 60                        | 0.016     | 17360                     | 280                        | 0.5                         | 1.9        |
| 1.25       | 60                        | 0.018     | 15280                     | 275                        | 0.5                         | 2.2        |
| 1.40       | 60                        | 0.021     | 13640                     | 285                        | 0.5                         | 2.4        |
| 1.50       | 60                        | 0.023     | 12730                     | 295                        | 0.5                         | 2.4        |
| 1.65       | 60                        | 0.026     | 11575                     | 300                        | 0.5                         | 2.6        |
| 1.80       | 60                        | 0.029     | 10610                     | 310                        | 1.0                         | 2.8        |

## Matières

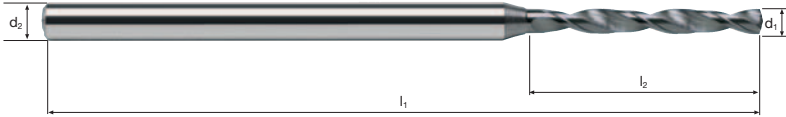
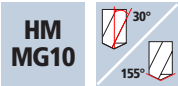
**Fonte**  
grise / sphéroïdale

Aluminium corroyé  
Si < 6%



# Microforets    Microdrill NX

8xd



Rm  
< 850

Rm  
850-1100

Rm  
1100-1300

Inox  
Stainless

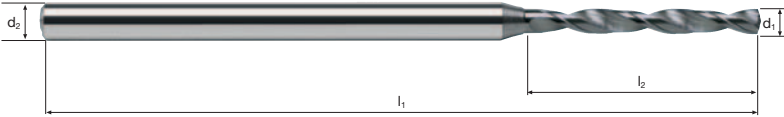
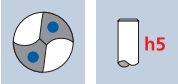
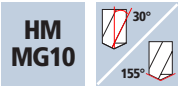
GG(G)  
Aluminium

| Exemple: N° cde |          |          |    |      |                  |  | DURO-SD |  |
|-----------------|----------|----------|----|------|------------------|--|---------|--|
| N° d'article    |          |          |    |      |                  |  | B57020  |  |
| Code-ø          |          |          |    |      |                  |  |         |  |
| ø<br>Code       | d1<br>m7 | d2<br>h5 | l1 | l2   | L <sub>max</sub> |  |         |  |
| new! .0080      | 0.80     | 3        | 46 | 7.6  | 6.4              |  | ●       |  |
| new! .0085      | 0.85     | 3        | 46 | 8.1  | 6.8              |  | ●       |  |
| new! .0090      | 0.90     | 3        | 46 | 8.5  | 7.2              |  | ●       |  |
| new! .0095      | 0.95     | 3        | 46 | 9.0  | 7.6              |  | ●       |  |
| new! .0100      | 1.00     | 3        | 48 | 9.5  | 8.0              |  | ●       |  |
| new! .0105      | 1.05     | 3        | 48 | 10.0 | 8.4              |  | ●       |  |
| new! .0110      | 1.10     | 3        | 48 | 10.4 | 8.8              |  | ●       |  |
| new! .0115      | 1.15     | 3        | 48 | 10.9 | 9.2              |  | ●       |  |
| new! .0120      | 1.20     | 3        | 48 | 11.4 | 9.6              |  | ●       |  |
| new! .0125      | 1.25     | 3        | 48 | 11.9 | 10.0             |  | ●       |  |
| new! .0130      | 1.30     | 3        | 48 | 12.3 | 10.4             |  | ●       |  |
| new! .0135      | 1.35     | 3        | 48 | 12.8 | 10.8             |  | ●       |  |
| new! .0140      | 1.40     | 3        | 50 | 13.3 | 11.2             |  | ●       |  |
| new! .0145      | 1.45     | 3        | 50 | 13.8 | 11.6             |  | ●       |  |
| new! .0150      | 1.50     | 3        | 50 | 14.2 | 12.0             |  | ●       |  |
| new! .0155      | 1.55     | 3        | 50 | 14.7 | 12.4             |  | ●       |  |
| new! .0160      | 1.60     | 3        | 50 | 15.2 | 12.8             |  | ●       |  |
| new! .0165      | 1.65     | 3        | 50 | 15.7 | 13.2             |  | ●       |  |
| new! .0170      | 1.70     | 3        | 52 | 16.1 | 13.6             |  | ●       |  |
| new! .0175      | 1.75     | 3        | 52 | 16.6 | 14.0             |  | ●       |  |
| new! .0180      | 1.80     | 3        | 52 | 17.1 | 14.4             |  | ●       |  |
| new! .0185      | 1.85     | 3        | 52 | 17.6 | 14.8             |  | ●       |  |

| Application                                                                       | Matières                                | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>       | 2.00       | 140                       | 0.039     | 22280                     | 870                        | 2.5                         | 1.1        |
|                                                                                   |                                         | 2.10       | 140                       | 0.041     | 21220                     | 870                        | 3.0                         | 1.2        |
|                                                                                   |                                         | 2.20       | 140                       | 0.043     | 20255                     | 870                        | 3.5                         | 1.2        |
|                                                                                   |                                         | 2.35       | 140                       | 0.047     | 18965                     | 890                        | 4.0                         | 1.3        |
|                                                                                   |                                         | 2.50       | 140                       | 0.051     | 17825                     | 910                        | 4.5                         | 1.3        |
|                                                                                   |                                         | 2.60       | 140                       | 0.053     | 17140                     | 910                        | 5.0                         | 1.4        |
|                                                                                   |                                         | 2.75       | 140                       | 0.058     | 16205                     | 940                        | 5.5                         | 1.4        |
|                                                                                   |                                         | 2.85       | 140                       | 0.060     | 15635                     | 940                        | 6.0                         | 1.5        |
|                                                                                   |                                         | 2.95       | 140                       | 0.064     | 15105                     | 965                        | 6.5                         | 1.5        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>500 - 850 N/mm <sup>2</sup>   | 2.00       | 100                       | 0.039     | 15915                     | 620                        | 2.0                         | 1.5        |
|                                                                                   |                                         | 2.10       | 100                       | 0.041     | 15160                     | 620                        | 2.0                         | 1.6        |
|                                                                                   |                                         | 2.20       | 100                       | 0.043     | 14470                     | 620                        | 2.5                         | 1.7        |
|                                                                                   |                                         | 2.35       | 100                       | 0.047     | 13545                     | 635                        | 3.0                         | 1.8        |
|                                                                                   |                                         | 2.50       | 100                       | 0.051     | 12730                     | 650                        | 3.0                         | 1.9        |
|                                                                                   |                                         | 2.60       | 100                       | 0.053     | 12245                     | 650                        | 3.5                         | 1.9        |
|                                                                                   |                                         | 2.75       | 100                       | 0.058     | 11575                     | 670                        | 4.0                         | 2.0        |
|                                                                                   |                                         | 2.85       | 100                       | 0.060     | 11170                     | 670                        | 4.5                         | 2.0        |
|                                                                                   |                                         | 2.95       | 100                       | 0.064     | 10790                     | 690                        | 4.5                         | 2.1        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | 2.00       | 80                        | 0.039     | 12730                     | 495                        | 1.5                         | 1.9        |
|                                                                                   |                                         | 2.10       | 80                        | 0.041     | 12125                     | 495                        | 1.5                         | 2.0        |
|                                                                                   |                                         | 2.20       | 80                        | 0.043     | 11575                     | 500                        | 2.0                         | 2.1        |
|                                                                                   |                                         | 2.35       | 80                        | 0.047     | 10835                     | 510                        | 2.0                         | 2.2        |
|                                                                                   |                                         | 2.50       | 80                        | 0.051     | 10185                     | 520                        | 2.5                         | 2.3        |
|                                                                                   |                                         | 2.60       | 80                        | 0.053     | 9795                      | 520                        | 3.0                         | 2.4        |
|                                                                                   |                                         | 2.75       | 80                        | 0.058     | 9260                      | 535                        | 3.0                         | 2.5        |
|                                                                                   |                                         | 2.85       | 80                        | 0.060     | 8935                      | 535                        | 3.5                         | 2.6        |
|                                                                                   |                                         | 2.95       | 80                        | 0.064     | 8630                      | 550                        | 4.0                         | 2.6        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aciers inoxydables<br>[Cr-Ni-Mo/1.4571] | 2.00       | 60                        | 0.036     | 9550                      | 345                        | 1.0                         | 2.8        |
|                                                                                   |                                         | 2.10       | 60                        | 0.038     | 9095                      | 345                        | 1.0                         | 2.9        |
|                                                                                   |                                         | 2.20       | 60                        | 0.040     | 8680                      | 345                        | 1.5                         | 3.1        |
|                                                                                   |                                         | 2.35       | 60                        | 0.044     | 8125                      | 360                        | 1.5                         | 3.1        |
|                                                                                   |                                         | 2.50       | 60                        | 0.047     | 7640                      | 360                        | 2.0                         | 3.4        |
|                                                                                   |                                         | 2.60       | 60                        | 0.050     | 7345                      | 365                        | 2.0                         | 3.4        |
|                                                                                   |                                         | 2.75       | 60                        | 0.054     | 6945                      | 375                        | 2.0                         | 3.5        |
|                                                                                   |                                         | 2.85       | 60                        | 0.057     | 6700                      | 380                        | 2.5                         | 3.6        |
|                                                                                   |                                         | 2.95       | 60                        | 0.059     | 6475                      | 380                        | 2.5                         | 3.7        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Matières                                | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|                                                                                   | Fonte<br>grise / sphéroïdale            | 2.00       | 150                       | 0.046     | 23875                     | 1100                       | 3.5                         | 0.9        |
|                                                                                   |                                         | 2.10       | 150                       | 0.048     | 22735                     | 1090                       | 4.0                         | 0.9        |
|                                                                                   |                                         | 2.20       | 150                       | 0.050     | 21705                     | 1085                       | 4.0                         | 1.0        |
|                                                                                   |                                         | 2.35       | 150                       | 0.055     | 20320                     | 1120                       | 5.0                         | 1.0        |
|                                                                                   |                                         | 2.50       | 150                       | 0.059     | 19100                     | 1125                       | 5.5                         | 1.1        |
|                                                                                   |                                         | 2.60       | 150                       | 0.063     | 18365                     | 1155                       | 6.0                         | 1.1        |
|                                                                                   |                                         | 2.75       | 150                       | 0.067     | 17360                     | 1165                       | 7.0                         | 1.1        |
|                                                                                   |                                         | 2.85       | 150                       | 0.069     | 16755                     | 1155                       | 7.5                         | 1.2        |
|                                                                                   |                                         | 2.95       | 150                       | 0.072     | 16185                     | 1165                       | 8.0                         | 1.2        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   | Aluminium corroyé<br>Si < 6%            | 2.00       | 200                       | 0.046     | 31830                     | 1465                       | 4.5                         | 0.7        |
|                                                                                   |                                         | 2.10       | 200                       | 0.048     | 30315                     | 1455                       | 5.0                         | 0.7        |
|                                                                                   |                                         | 2.20       | 200                       | 0.050     | 28935                     | 1445                       | 5.5                         | 0.7        |
|                                                                                   |                                         | 2.35       | 200                       | 0.055     | 27090                     | 1490                       | 6.5                         | 0.8        |
|                                                                                   |                                         | 2.50       | 200                       | 0.059     | 25465                     | 1500                       | 7.5                         | 0.8        |
|                                                                                   |                                         | 2.60       | 200                       | 0.063     | 24485                     | 1545                       | 8.0                         | 0.8        |
|                                                                                   |                                         | 2.75       | 200                       | 0.067     | 23150                     | 1550                       | 9.0                         | 0.9        |
|                                                                                   |                                         | 2.85       | 200                       | 0.069     | 22340                     | 1540                       | 10.0                        | 0.9        |
|                                                                                   |                                         | 2.95       | 200                       | 0.072     | 21580                     | 1555                       | 10.5                        | 0.9        |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |
|                                                                                   |                                         |            |                           |           |                           |                            |                             |            |

# Microforets    Microdrill NX

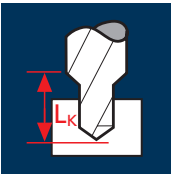
8xd



|             |                |                 |  |  |  |  |                   |  |                    |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|--------------------|

| Exemple:<br>N° cde     |          |          |    |      |                  | DURO-SD |   |
|------------------------|----------|----------|----|------|------------------|---------|---|
| N° d'article<br>B57020 |          |          |    |      |                  | B57020  |   |
| Code-ø<br>.0190        |          |          |    |      |                  |         |   |
| ø<br>Code              | d1<br>m7 | d2<br>h5 | l1 | l2   | L <sub>max</sub> |         |   |
| new!<br>.0190          | 1.90     | 3        | 52 | 18.0 | 15.2             |         | ● |
| new!<br>.0195          | 1.95     | 3        | 52 | 18.5 | 15.6             |         | ● |
| .0200                  | 2.00     | 3        | 56 | 19.0 | 16.0             |         | ● |
| .0205                  | 2.05     | 3        | 56 | 19.5 | 16.4             |         | ● |
| .0210                  | 2.10     | 3        | 56 | 20.0 | 16.9             |         | ● |
| .0215                  | 2.15     | 3        | 56 | 20.4 | 17.2             |         | ● |
| .0220                  | 2.20     | 3        | 56 | 20.9 | 17.6             |         | ● |
| .0225                  | 2.25     | 3        | 56 | 21.4 | 18.0             |         | ● |
| .0230                  | 2.30     | 3        | 56 | 21.9 | 18.5             |         | ● |
| .0235                  | 2.35     | 3        | 56 | 22.3 | 18.8             |         | ● |
| .0240                  | 2.40     | 3        | 56 | 22.8 | 19.2             |         | ● |
| .0245                  | 2.45     | 3        | 56 | 23.3 | 19.6             |         | ● |
| .0250                  | 2.50     | 3        | 56 | 23.8 | 20.1             |         | ● |
| .0255                  | 2.55     | 3        | 60 | 24.2 | 20.4             |         | ● |
| .0260                  | 2.60     | 3        | 60 | 24.7 | 20.8             |         | ● |
| .0265                  | 2.65     | 3        | 60 | 25.2 | 21.2             |         | ● |
| .0270                  | 2.70     | 3        | 60 | 25.7 | 21.7             |         | ● |
| .0275                  | 2.75     | 3        | 60 | 26.1 | 22.0             |         | ● |
| .0280                  | 2.80     | 3        | 60 | 26.6 | 22.4             |         | ● |
| .0285                  | 2.85     | 3        | 60 | 27.1 | 22.8             |         | ● |
| .0290                  | 2.90     | 3        | 60 | 27.6 | 23.3             |         | ● |
| .0295                  | 2.95     | 3        | 60 | 28.0 | 23.6             |         | ● |
|                        |          |          |    |      |                  |         |   |

## Application



## Matières

**Aciers**  
**< 500 N/mm<sup>2</sup>**

**Aciers**  
500 - 850 N/mm<sup>2</sup>

**Aciers**  
850 - 1100 N/mm<sup>2</sup>

**Fonte**  
grise / sphéroïdale

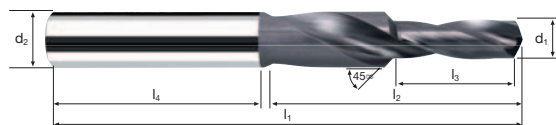
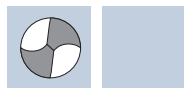
| d1<br>[mm] | pour | v <sub>c</sub><br>[m/min] | f<br>[mm] | L <sub>K</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] |
|------------|------|---------------------------|-----------|------------------------|---------------------------|----------------------------|-----------------------------|
| 2.50       | M3   | 110                       | 0.045     | 9.6                    | 11670                     | 525                        | 3.5                         |
| 3.30       | M4   | 110                       | 0.055     | 12.5                   | 8755                      | 480                        | 6.0                         |
| 4.20       | M5   | 110                       | 0.070     | 14.9                   | 7005                      | 490                        | 9.5                         |
| 5.00       | M6   | 110                       | 0.085     | 18.1                   | 5835                      | 495                        | 14.0                        |
| 6.80       | M8   | 110                       | 0.115     | 23.0                   | 4375                      | 505                        | 25.5                        |
| 8.50       | M10  | 110                       | 0.145     | 28.0                   | 3500                      | 505                        | 39.5                        |
| 10.20      | M12  | 110                       | 0.170     | 33.1                   | 2920                      | 495                        | 56.0                        |
| 14.00      | M16  | 110                       | 0.230     | 42.4                   | 2190                      | 505                        | 101.5                       |
|            |      |                           |           |                        |                           |                            |                             |
| 2.50       | M3   | 80                        | 0.045     | 9.6                    | 8490                      | 380                        | 2.5                         |
| 3.30       | M4   | 80                        | 0.055     | 12.5                   | 6365                      | 350                        | 4.5                         |
| 4.20       | M5   | 80                        | 0.070     | 14.9                   | 5095                      | 355                        | 7.0                         |
| 5.00       | M6   | 80                        | 0.085     | 18.1                   | 4245                      | 360                        | 10.0                        |
| 6.80       | M8   | 80                        | 0.115     | 23.0                   | 3185                      | 365                        | 18.5                        |
| 8.50       | M10  | 80                        | 0.145     | 28.0                   | 2545                      | 370                        | 29.0                        |
| 10.20      | M12  | 80                        | 0.170     | 33.1                   | 2120                      | 360                        | 40.5                        |
| 14.00      | M16  | 80                        | 0.230     | 42.4                   | 1590                      | 365                        | 73.5                        |
|            |      |                           |           |                        |                           |                            |                             |
| 2.50       | M3   | 55                        | 0.040     | 9.6                    | 5835                      | 235                        | 1.5                         |
| 3.30       | M4   | 55                        | 0.050     | 12.5                   | 4375                      | 220                        | 3.0                         |
| 4.20       | M5   | 55                        | 0.065     | 14.9                   | 3500                      | 230                        | 4.5                         |
| 5.00       | M6   | 55                        | 0.075     | 18.1                   | 2920                      | 220                        | 6.0                         |
| 6.80       | M8   | 55                        | 0.100     | 23.0                   | 2190                      | 220                        | 11.0                        |
| 8.50       | M10  | 55                        | 0.125     | 28.0                   | 1750                      | 220                        | 17.5                        |
| 10.20      | M12  | 55                        | 0.150     | 33.1                   | 1460                      | 220                        | 25.0                        |
| 14.00      | M16  | 55                        | 0.200     | 42.4                   | 1095                      | 220                        | 44.0                        |
|            |      |                           |           |                        |                           |                            |                             |
| 2.50       | M3   | 160                       | 0.080     | 9.6                    | 16975                     | 1360                       | 9.5                         |
| 3.30       | M4   | 160                       | 0.105     | 12.5                   | 12730                     | 1335                       | 17.0                        |
| 4.20       | M5   | 160                       | 0.130     | 14.9                   | 10185                     | 1325                       | 26.0                        |
| 5.00       | M6   | 160                       | 0.160     | 18.1                   | 8490                      | 1360                       | 38.5                        |
| 6.80       | M8   | 160                       | 0.210     | 23.0                   | 6365                      | 1335                       | 67.0                        |
| 8.50       | M10  | 160                       | 0.265     | 28.0                   | 5095                      | 1350                       | 106.0                       |
| 10.20      | M12  | 160                       | 0.315     | 33.1                   | 4245                      | 1335                       | 151.0                       |
| 14.00      | M16  | 160                       | 0.420     | 42.4                   | 3185                      | 1340                       | 269.5                       |
|            |      |                           |           |                        |                           |                            |                             |

## Matières

Aluminium corroyé  
Si < 6%

[illegible]

3xd, pour avant-trous de taraudage

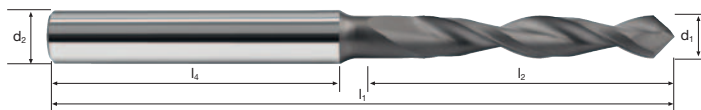


|             |                |                 |  |  |  |  |  |  |                    |
|-------------|----------------|-----------------|--|--|--|--|--|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  |  |  | GG(G)<br>Aluminium |
|-------------|----------------|-----------------|--|--|--|--|--|--|--------------------|

[illegible]

| Application                                                                       | Matières     | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|--------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Matières CFC | 3.00       | 100                       | 0.050     | 10610                     | 530                        | 3.5                         | 1.8        |
|                                                                                   |              | 4.00       | 100                       | 0.060     | 7960                      | 480                        | 6.0                         | 2.4        |
|                                                                                   |              | 4.83       | 100                       | 0.080     | 6590                      | 525                        | 9.5                         | 2.1        |
|                                                                                   |              | 5.00       | 100                       | 0.090     | 6365                      | 575                        | 11.5                        | 2.0        |
|                                                                                   |              | 6.00       | 100                       | 0.095     | 5305                      | 505                        | 14.5                        | 3.5        |
|                                                                                   |              | 6.35       | 100                       | 0.100     | 5015                      | 500                        | 16.0                        | 3.5        |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |

3xd



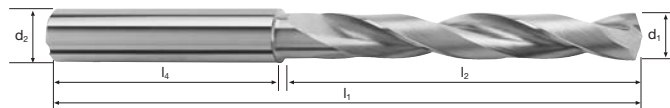
CFK

[illegible]

| Application                                                                       | Matières        | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|-----------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Matières CFC/Ti | 4.83       | 20                        | 0.060     | 1320                      | 80                         | 1.5                         | 25.7       |
|                                                                                   |                 | 6.35       | 20                        | 0.080     | 1005                      | 80                         | 2.5                         | 30.8       |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   | Matières CFC/Al | 4.83       | 40                        | 0.060     | 2635                      | 160                        | 3.0                         | 12.9       |
|                                                                                   |                 | 6.35       | 40                        | 0.080     | 2005                      | 160                        | 5.0                         | 15.4       |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |
|                                                                                   |                 |            |                           |           |                           |                            |                             |            |



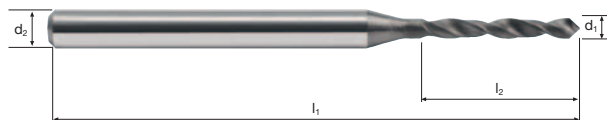
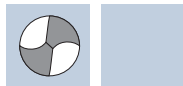
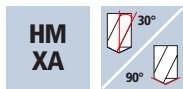
5xd

[illegible]

| Application                                                                       | Matières     | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | Q<br>[cm <sup>3</sup> /min] | T<br>[sek] |
|-----------------------------------------------------------------------------------|--------------|------------|---------------------------|-----------|---------------------------|----------------------------|-----------------------------|------------|
|  | Matières CFC | 1.50       | 100                       | 0.050     | 21220                     | 1060                       | 2.0                         | 0.3        |
|                                                                                   |              | 2.00       | 100                       | 0.060     | 15915                     | 875                        | 2.5                         | 0.4        |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |
|                                                                                   |              |            |                           |           |                           |                            |                             |            |

Microforets    Microdrill CFK

3xd



CFK

[illegible]

| Application                                                                       | Matières                    | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] |  |
|-----------------------------------------------------------------------------------|-----------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|--|
|  | Aciers<br>< 500 N/mm²       | 3          | 160                       | 0.070     | 16975                     | 1190                       |  |
|                                                                                   |                             | 4          | 160                       | 0.095     | 12730                     | 1210                       |  |
|                                                                                   |                             | 5          | 160                       | 0.120     | 10185                     | 1220                       |  |
|                                                                                   |                             | 6          | 160                       | 0.145     | 8490                      | 1230                       |  |
|                                                                                   |                             | 8          | 160                       | 0.190     | 6365                      | 1210                       |  |
|                                                                                   |                             | 10         | 160                       | 0.240     | 5095                      | 1225                       |  |
|                                                                                   |                             | 12         | 160                       | 0.285     | 4245                      | 1210                       |  |
|                                                                                   |                             | 16         | 160                       | 0.380     | 3185                      | 1210                       |  |
|                                                                                   |                             |            |                           |           |                           |                            |  |
|                                                                                   |                             |            |                           |           |                           |                            |  |
|                                                                                   | Aciers<br>500 - 850 N/mm²   | 3          | 120                       | 0.070     | 12730                     | 890                        |  |
|                                                                                   |                             | 4          | 120                       | 0.095     | 9550                      | 905                        |  |
|                                                                                   |                             | 5          | 120                       | 0.120     | 7640                      | 915                        |  |
|                                                                                   |                             | 6          | 120                       | 0.145     | 6365                      | 925                        |  |
|                                                                                   |                             | 8          | 120                       | 0.190     | 4775                      | 905                        |  |
|                                                                                   |                             | 10         | 120                       | 0.240     | 3820                      | 915                        |  |
|                                                                                   |                             | 12         | 120                       | 0.285     | 3185                      | 910                        |  |
|                                                                                   |                             | 16         | 120                       | 0.380     | 2385                      | 905                        |  |
|                                                                                   |                             |            |                           |           |                           |                            |  |
|                                                                                   |                             |            |                           |           |                           |                            |  |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | 3          | 90                        | 0.030     | 9550                      | 285                        |  |
|                                                                                   |                             | 4          | 90                        | 0.040     | 7160                      | 285                        |  |
|                                                                                   |                             | 5          | 90                        | 0.050     | 5730                      | 285                        |  |
|                                                                                   |                             | 6          | 90                        | 0.060     | 4775                      | 285                        |  |
|                                                                                   |                             | 8          | 90                        | 0.080     | 3580                      | 285                        |  |
|                                                                                   |                             | 10         | 90                        | 0.095     | 2865                      | 270                        |  |
|                                                                                   |                             | 12         | 90                        | 0.115     | 2385                      | 275                        |  |
|                                                                                   |                             | 16         | 90                        | 0.155     | 1790                      | 275                        |  |
|                                                                                   |                             |            |                           |           |                           |                            |  |
|                                                                                   |                             |            |                           |           |                           |                            |  |
|                                                                                   | Aciers<br>1100 - 1300 N/mm² | 3          | 60                        | 0.025     | 6365                      | 160                        |  |
|                                                                                   |                             | 4          | 60                        | 0.035     | 4775                      | 165                        |  |
|                                                                                   |                             | 5          | 60                        | 0.040     | 3820                      | 155                        |  |
|                                                                                   |                             | 6          | 60                        | 0.050     | 3185                      | 160                        |  |
|                                                                                   |                             | 8          | 60                        | 0.065     | 2385                      | 155                        |  |
|                                                                                   |                             | 10         | 60                        | 0.080     | 1910                      | 155                        |  |
|                                                                                   |                             | 12         | 60                        | 0.095     | 1590                      | 150                        |  |
|                                                                                   |                             | 16         | 60                        | 0.130     | 1195                      | 155                        |  |
|                                                                                   |                             |            |                           |           |                           |                            |  |
|                                                                                   |                             |            |                           |           |                           |                            |  |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] |  |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|--|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 3          | 30                        | 0.025     | 3185                      | 80                         |  |
|                                                                                                                        | 4          | 30                        | 0.035     | 2385                      | 85                         |  |
|                                                                                                                        | 5          | 30                        | 0.040     | 1910                      | 75                         |  |
|                                                                                                                        | 6          | 30                        | 0.050     | 1590                      | 80                         |  |
|                                                                                                                        | 8          | 30                        | 0.065     | 1195                      | 80                         |  |
|                                                                                                                        | 10         | 30                        | 0.080     | 955                       | 75                         |  |
|                                                                                                                        | 12         | 30                        | 0.095     | 795                       | 75                         |  |
|                                                                                                                        | 16         | 30                        | 0.130     | 595                       | 75                         |  |
|                                                                                                                        |            |                           |           |                           |                            |  |
|                                                                                                                        |            |                           |           |                           |                            |  |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 3          | 40                        | 0.015     | 4245                      | 65                         |  |
|                                                                                                                        | 4          | 40                        | 0.020     | 3185                      | 65                         |  |
|                                                                                                                        | 5          | 40                        | 0.025     | 2545                      | 65                         |  |
|                                                                                                                        | 6          | 40                        | 0.030     | 2120                      | 65                         |  |
|                                                                                                                        | 8          | 40                        | 0.040     | 1590                      | 65                         |  |
|                                                                                                                        | 10         | 40                        | 0.045     | 1275                      | 55                         |  |
|                                                                                                                        | 12         | 40                        | 0.060     | 1060                      | 65                         |  |
|                                                                                                                        | 16         | 40                        | 0.075     | 795                       | 60                         |  |
|                                                                                                                        |            |                           |           |                           |                            |  |
|                                                                                                                        |            |                           |           |                           |                            |  |
| Fonte<br>grise / sphéroïdale                                                                                           | 3          | 180                       | 0.075     | 19100                     | 1435                       |  |
|                                                                                                                        | 4          | 180                       | 0.105     | 14325                     | 1505                       |  |
|                                                                                                                        | 5          | 180                       | 0.130     | 11460                     | 1490                       |  |
|                                                                                                                        | 6          | 180                       | 0.160     | 9550                      | 1530                       |  |
|                                                                                                                        | 8          | 180                       | 0.210     | 7160                      | 1505                       |  |
|                                                                                                                        | 10         | 180                       | 0.265     | 5730                      | 1520                       |  |
|                                                                                                                        | 12         | 180                       | 0.315     | 4775                      | 1505                       |  |
|                                                                                                                        | 16         | 180                       | 0.420     | 3580                      | 1505                       |  |
|                                                                                                                        |            |                           |           |                           |                            |  |
|                                                                                                                        |            |                           |           |                           |                            |  |
| Aluminium corroyé<br>Si < 6%                                                                                           | 3          | 220                       | 0.075     | 23345                     | 1750                       |  |
|                                                                                                                        | 4          | 220                       | 0.105     | 17505                     | 1840                       |  |
|                                                                                                                        | 5          | 220                       | 0.130     | 14005                     | 1820                       |  |
|                                                                                                                        | 6          | 220                       | 0.160     | 11670                     | 1865                       |  |
|                                                                                                                        | 8          | 220                       | 0.210     | 8755                      | 1840                       |  |
|                                                                                                                        | 10         | 220                       | 0.265     | 7005                      | 1855                       |  |
|                                                                                                                        | 12         | 220                       | 0.315     | 5835                      | 1840                       |  |
|                                                                                                                        | 16         | 220                       | 0.420     | 4375                      | 1840                       |  |
|                                                                                                                        |            |                           |           |                           |                            |  |
|                                                                                                                        |            |                           |           |                           |                            |  |

## 90°

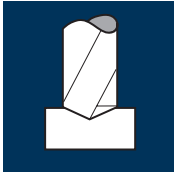
Technical drawing of a drill bit. The drawing shows a cylindrical body with a diameter  $d_2$  and a total length  $l_1$ . The tip of the drill bit has a diameter  $d_1$  and a cutting angle of  $90^\circ$ .

GG(G)  
Aluminium[illegible]

| Application                                                                       | Matières              | d1<br>[mm]                | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] |     |  |
|-----------------------------------------------------------------------------------|-----------------------|---------------------------|---------------------------|-----------|---------------------------|----------------------------|-----|--|
|  | Aciers<br>< 500 N/mm² | 3                         | 160                       | 0.070     | 16975                     | 1190                       |     |  |
|                                                                                   |                       | 4                         | 160                       | 0.095     | 12730                     | 1210                       |     |  |
|                                                                                   |                       | 5                         | 160                       | 0.120     | 10185                     | 1220                       |     |  |
|                                                                                   |                       | 6                         | 160                       | 0.145     | 8490                      | 1230                       |     |  |
|                                                                                   |                       | 8                         | 160                       | 0.190     | 6365                      | 1210                       |     |  |
|                                                                                   |                       | 10                        | 160                       | 0.240     | 5095                      | 1225                       |     |  |
|                                                                                   |                       | 12                        | 160                       | 0.285     | 4245                      | 1210                       |     |  |
|                                                                                   |                       | 16                        | 160                       | 0.380     | 3185                      | 1210                       |     |  |
|                                                                                   |                       |                           |                           |           |                           |                            |     |  |
|                                                                                   |                       | Aciers<br>500 - 850 N/mm² | 3                         | 120       | 0.070                     | 12730                      | 890 |  |
| 4                                                                                 | 120                   |                           | 0.095                     | 9550      | 905                       |                            |     |  |
| 5                                                                                 | 120                   |                           | 0.120                     | 7640      | 915                       |                            |     |  |
| 6                                                                                 | 120                   |                           | 0.145                     | 6365      | 925                       |                            |     |  |
| 8                                                                                 | 120                   |                           | 0.190                     | 4775      | 905                       |                            |     |  |
| 10                                                                                | 120                   |                           | 0.240                     | 3820      | 915                       |                            |     |  |
| 12                                                                                | 120                   |                           | 0.285                     | 3185      | 910                       |                            |     |  |
| 16                                                                                | 120                   |                           | 0.380                     | 2385      | 905                       |                            |     |  |
|                                                                                   |                       |                           |                           |           |                           |                            |     |  |
| Aciers<br>850 - 1100 N/mm²                                                        | 3                     | 90                        | 0.060                     | 9550      | 575                       |                            |     |  |
|                                                                                   | 4                     | 90                        | 0.075                     | 7160      | 535                       |                            |     |  |
|                                                                                   | 5                     | 90                        | 0.095                     | 5730      | 545                       |                            |     |  |
|                                                                                   | 6                     | 90                        | 0.115                     | 4775      | 550                       |                            |     |  |
|                                                                                   | 8                     | 90                        | 0.155                     | 3580      | 555                       |                            |     |  |
|                                                                                   | 10                    | 90                        | 0.190                     | 2865      | 545                       |                            |     |  |
|                                                                                   | 12                    | 90                        | 0.230                     | 2385      | 550                       |                            |     |  |
|                                                                                   | 16                    | 90                        | 0.310                     | 1790      | 555                       |                            |     |  |
|                                                                                   |                       |                           |                           |           |                           |                            |     |  |
| Aciers<br>1100 - 1300 N/mm²                                                       | 3                     | 60                        | 0.050                     | 6365      | 320                       |                            |     |  |
|                                                                                   | 4                     | 60                        | 0.065                     | 4775      | 310                       |                            |     |  |
|                                                                                   | 5                     | 60                        | 0.080                     | 3820      | 305                       |                            |     |  |
|                                                                                   | 6                     | 60                        | 0.095                     | 3185      | 305                       |                            |     |  |
|                                                                                   | 8                     | 60                        | 0.125                     | 2385      | 300                       |                            |     |  |
|                                                                                   | 10                    | 60                        | 0.160                     | 1910      | 305                       |                            |     |  |
|                                                                                   | 12                    | 60                        | 0.190                     | 1590      | 300                       |                            |     |  |
|                                                                                   | 16                    | 60                        | 0.255                     | 1195      | 305                       |                            |     |  |
|                                                                                   |                       |                           |                           |           |                           |                            |     |  |

| Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] |  |
|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|--|
| Aciers<br>1300 - 1500 N/mm²                                                                                            | 3          | 30                        | 0.050     | 3185                      | 160                        |  |
|                                                                                                                        | 4          | 30                        | 0.065     | 2385                      | 155                        |  |
|                                                                                                                        | 5          | 30                        | 0.080     | 1910                      | 155                        |  |
|                                                                                                                        | 6          | 30                        | 0.095     | 1590                      | 150                        |  |
|                                                                                                                        | 8          | 30                        | 0.125     | 1195                      | 150                        |  |
|                                                                                                                        | 10         | 30                        | 0.160     | 955                       | 155                        |  |
|                                                                                                                        | 12         | 30                        | 0.190     | 795                       | 150                        |  |
|                                                                                                                        | 16         | 30                        | 0.255     | 595                       | 150                        |  |
|                                                                                                                        |            |                           |           |                           |                            |  |
| Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 3          | 60                        | 0.040     | 6365                      | 255                        |  |
|                                                                                                                        | 4          | 60                        | 0.055     | 4775                      | 265                        |  |
|                                                                                                                        | 5          | 60                        | 0.070     | 3820                      | 265                        |  |
|                                                                                                                        | 6          | 60                        | 0.080     | 3185                      | 255                        |  |
|                                                                                                                        | 8          | 60                        | 0.110     | 2385                      | 260                        |  |
|                                                                                                                        | 10         | 60                        | 0.135     | 1910                      | 260                        |  |
|                                                                                                                        | 12         | 60                        | 0.165     | 1590                      | 260                        |  |
|                                                                                                                        | 16         | 60                        | 0.220     | 1195                      | 265                        |  |
|                                                                                                                        |            |                           |           |                           |                            |  |
| Fonte<br>grise / sphéroïdale                                                                                           | 3          | 180                       | 0.080     | 19100                     | 1530                       |  |
|                                                                                                                        | 4          | 180                       | 0.105     | 14325                     | 1505                       |  |
|                                                                                                                        | 5          | 180                       | 0.130     | 11460                     | 1490                       |  |
|                                                                                                                        | 6          | 180                       | 0.160     | 9550                      | 1530                       |  |
|                                                                                                                        | 8          | 180                       | 0.210     | 7160                      | 1505                       |  |
|                                                                                                                        | 10         | 180                       | 0.265     | 5730                      | 1520                       |  |
|                                                                                                                        | 12         | 180                       | 0.315     | 4775                      | 1505                       |  |
|                                                                                                                        | 16         | 180                       | 0.420     | 3580                      | 1505                       |  |
|                                                                                                                        |            |                           |           |                           |                            |  |
| Aluminium corroyé<br>Si < 6%                                                                                           | 3          | 220                       | 0.080     | 23345                     | 1870                       |  |
|                                                                                                                        | 4          | 220                       | 0.105     | 17505                     | 1840                       |  |
|                                                                                                                        | 5          | 220                       | 0.130     | 14005                     | 1820                       |  |
|                                                                                                                        | 6          | 220                       | 0.160     | 11670                     | 1865                       |  |
|                                                                                                                        | 8          | 220                       | 0.210     | 8755                      | 1840                       |  |
|                                                                                                                        | 10         | 220                       | 0.265     | 7005                      | 1855                       |  |
|                                                                                                                        | 12         | 220                       | 0.315     | 5835                      | 1840                       |  |
|                                                                                                                        | 16         | 220                       | 0.420     | 4375                      | 1840                       |  |
|                                                                                                                        |            |                           |           |                           |                            |  |



| Application                                                                      | Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] |  |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------|---------------------------|-----------|---------------------------|----------------------------|--|
|  | Aciers<br>< 500 N/mm <sup>2</sup>                                                                                      | 3          | 160                       | 0.070     | 16975                     | 1190                       |  |
|                                                                                  |                                                                                                                        | 4          | 160                       | 0.095     | 12730                     | 1210                       |  |
|                                                                                  |                                                                                                                        | 5          | 160                       | 0.120     | 10185                     | 1220                       |  |
|                                                                                  |                                                                                                                        | 6          | 160                       | 0.145     | 8490                      | 1230                       |  |
|                                                                                  |                                                                                                                        | 8          | 160                       | 0.190     | 6365                      | 1210                       |  |
|                                                                                  |                                                                                                                        | 10         | 160                       | 0.240     | 5095                      | 1225                       |  |
|                                                                                  |                                                                                                                        | 12         | 160                       | 0.285     | 4245                      | 1210                       |  |
|                                                                                  |                                                                                                                        | 16         | 160                       | 0.380     | 3185                      | 1210                       |  |
|                                                                                  |                                                                                                                        | 3          | 120                       | 0.070     | 12730                     | 890                        |  |
|                                                                                  |                                                                                                                        | 4          | 120                       | 0.095     | 9550                      | 905                        |  |
|                                                                                  |                                                                                                                        | 5          | 120                       | 0.120     | 7640                      | 915                        |  |
|                                                                                  |                                                                                                                        | 6          | 120                       | 0.145     | 6365                      | 925                        |  |
|                                                                                  |                                                                                                                        | 8          | 120                       | 0.190     | 4775                      | 905                        |  |
|                                                                                  |                                                                                                                        | 10         | 120                       | 0.240     | 3820                      | 915                        |  |
|                                                                                  |                                                                                                                        | 12         | 120                       | 0.285     | 3185                      | 910                        |  |
|                                                                                  |                                                                                                                        | 16         | 120                       | 0.380     | 2385                      | 905                        |  |
|                                                                                  |                                                                                                                        | 3          | 90                        | 0.060     | 9550                      | 575                        |  |
|                                                                                  |                                                                                                                        | 4          | 90                        | 0.075     | 7160                      | 535                        |  |
|                                                                                  |                                                                                                                        | 5          | 90                        | 0.095     | 5730                      | 545                        |  |
|                                                                                  |                                                                                                                        | 6          | 90                        | 0.115     | 4775                      | 550                        |  |
|                                                                                  |                                                                                                                        | 8          | 90                        | 0.155     | 3580                      | 555                        |  |
|                                                                                  |                                                                                                                        | 10         | 90                        | 0.190     | 2865                      | 545                        |  |
|                                                                                  |                                                                                                                        | 12         | 90                        | 0.230     | 2385                      | 550                        |  |
|                                                                                  |                                                                                                                        | 16         | 90                        | 0.310     | 1790                      | 555                        |  |
|                                                                                  |                                                                                                                        | 3          | 60                        | 0.050     | 6365                      | 320                        |  |
|                                                                                  |                                                                                                                        | 4          | 60                        | 0.065     | 4775                      | 310                        |  |
|                                                                                  |                                                                                                                        | 5          | 60                        | 0.080     | 3820                      | 305                        |  |
|                                                                                  |                                                                                                                        | 6          | 60                        | 0.095     | 3185                      | 305                        |  |
|                                                                                  |                                                                                                                        | 8          | 60                        | 0.125     | 2385                      | 300                        |  |
|                                                                                  |                                                                                                                        | 10         | 60                        | 0.160     | 1910                      | 305                        |  |
|                                                                                  |                                                                                                                        | 12         | 60                        | 0.190     | 1590                      | 300                        |  |
|                                                                                  |                                                                                                                        | 16         | 60                        | 0.255     | 1195                      | 305                        |  |
|                                                                                  | Matières                                                                                                               | d1<br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] |  |
|                                                                                  | Aciers<br>1300 - 1500 N/mm <sup>2</sup>                                                                                | 3          | 30                        | 0.050     | 3185                      | 160                        |  |
|                                                                                  |                                                                                                                        | 4          | 30                        | 0.065     | 2385                      | 155                        |  |
|                                                                                  |                                                                                                                        | 5          | 30                        | 0.080     | 1910                      | 155                        |  |
|                                                                                  |                                                                                                                        | 6          | 30                        | 0.095     | 1590                      | 150                        |  |
|                                                                                  |                                                                                                                        | 8          | 30                        | 0.125     | 1195                      | 150                        |  |
|                                                                                  |                                                                                                                        | 10         | 30                        | 0.160     | 955                       | 155                        |  |
|                                                                                  |                                                                                                                        | 12         | 30                        | 0.190     | 795                       | 150                        |  |
|                                                                                  |                                                                                                                        | 16         | 30                        | 0.255     | 595                       | 150                        |  |
|                                                                                  | Aciers à outil pour<br>travail à froid (12% Cr)<br>fortement allié<br>[1.2379]<br>Aciers inoxydables<br>[Cr-Ni/1.4301] | 3          | 60                        | 0.040     | 6365                      | 255                        |  |
|                                                                                  |                                                                                                                        | 4          | 60                        | 0.055     | 4775                      | 265                        |  |
|                                                                                  |                                                                                                                        | 5          | 60                        | 0.070     | 3820                      | 265                        |  |
|                                                                                  |                                                                                                                        | 6          | 60                        | 0.080     | 3185                      | 255                        |  |
|                                                                                  |                                                                                                                        | 8          | 60                        | 0.110     | 2385                      | 260                        |  |
|                                                                                  |                                                                                                                        | 10         | 60                        | 0.135     | 1910                      | 260                        |  |
|                                                                                  |                                                                                                                        | 12         | 60                        | 0.165     | 1590                      | 260                        |  |
|                                                                                  |                                                                                                                        | 16         | 60                        | 0.220     | 1195                      | 265                        |  |
|                                                                                  | Fonte<br>grise / sphéroïdale                                                                                           | 3          | 180                       | 0.080     | 19100                     | 1530                       |  |
|                                                                                  |                                                                                                                        | 4          | 180                       | 0.105     | 14325                     | 1505                       |  |
|                                                                                  |                                                                                                                        | 5          | 180                       | 0.130     | 11460                     | 1490                       |  |
|                                                                                  |                                                                                                                        | 6          | 180                       | 0.160     | 9550                      | 1530                       |  |
|                                                                                  |                                                                                                                        | 8          | 180                       | 0.210     | 7160                      | 1505                       |  |
|                                                                                  |                                                                                                                        | 10         | 180                       | 0.265     | 5730                      | 1520                       |  |
|                                                                                  |                                                                                                                        | 12         | 180                       | 0.315     | 4775                      | 1505                       |  |
|                                                                                  |                                                                                                                        | 16         | 180                       | 0.420     | 3580                      | 1505                       |  |
|                                                                                  | Aluminium corroyé<br>Si < 6%                                                                                           | 3          | 220                       | 0.080     | 23345                     | 1870                       |  |
|                                                                                  |                                                                                                                        | 4          | 220                       | 0.105     | 17505                     | 1840                       |  |
|                                                                                  |                                                                                                                        | 5          | 220                       | 0.130     | 14005                     | 1820                       |  |
|                                                                                  |                                                                                                                        | 6          | 220                       | 0.160     | 11670                     | 1865                       |  |
|                                                                                  |                                                                                                                        | 8          | 220                       | 0.210     | 8755                      | 1840                       |  |
|                                                                                  |                                                                                                                        | 10         | 220                       | 0.265     | 7005                      | 1855                       |  |
|                                                                                  |                                                                                                                        | 12         | 220                       | 0.315     | 5835                      | 1840                       |  |
|                                                                                  |                                                                                                                        | 16         | 220                       | 0.420     | 4375                      | 1840                       |  |



144°

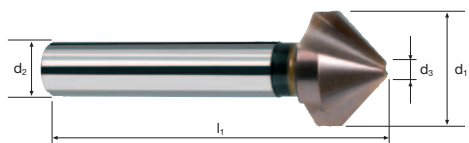
Technical drawing of a drill bit. The drawing shows a cylindrical body with diameter  $d_2$  and length  $l_1$ . The tip of the drill bit has a diameter  $d_1$  and a cutting angle of  $144^\circ$ .

GG(G)  
Aluminium[illegible]

## Fraises coniques

90°

HM



**Rm**  
**< 850**

**Rm**  
850-1100

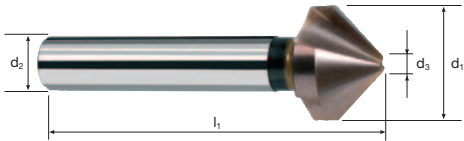
**Inox**  
Stainless

GG(G)  
Aluminium[illegible]

# Fraises coniques

90°

|     |  |
|-----|--|
| HSS |  |
|     |  |
|     |  |
|     |  |



|             |                |  |  |  |  |  |                   |  |                    |
|-------------|----------------|--|--|--|--|--|-------------------|--|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 |  |  |  |  |  | Inox<br>Stainless |  | GG(G)<br>Aluminium |
|-------------|----------------|--|--|--|--|--|-------------------|--|--------------------|

| Exemple: N° cde |                                                |          |     |    |   | N° d'article |  | Code-ø |  |  |  |        |                 |
|-----------------|------------------------------------------------|----------|-----|----|---|--------------|--|--------|--|--|--|--------|-----------------|
|                 |                                                |          |     |    |   | B92310       |  | .0530  |  |  |  | B92300 | U-4XD<br>B92310 |
| ø<br>Code       | d1<br>z9                                       | d2<br>h9 | d3  | l1 | z |              |  |        |  |  |  |        |                 |
| .0530           | 5.3                                            | 4        | 1.5 | 40 | 3 |              |  |        |  |  |  | ●      | ●               |
| .0580           | 5.8                                            | 5        | 1.5 | 45 | 3 |              |  |        |  |  |  | ●      | ●               |
| .0630           | 6.3                                            | 5        | 1.5 | 45 | 3 |              |  |        |  |  |  | ●      | ●               |
| .0730           | 7.3                                            | 6        | 1.8 | 50 | 3 |              |  |        |  |  |  | ●      | ●               |
| .0830           | 8.3                                            | 6        | 2.0 | 50 | 3 |              |  |        |  |  |  | ●      | ●               |
| .0940           | 9.4                                            | 6        | 2.2 | 50 | 3 |              |  |        |  |  |  | ●      | ●               |
| .1040           | 10.4                                           | 6        | 2.5 | 50 | 3 |              |  |        |  |  |  | ●      | ●               |
| .1150           | 11.5                                           | 8        | 2.8 | 56 | 3 |              |  |        |  |  |  | ●      | ●               |
| .1240           | 12.4                                           | 8        | 2.8 | 56 | 3 |              |  |        |  |  |  | ●      | ●               |
| .1340           | 13.4                                           | 8        | 2.9 | 56 | 3 |              |  |        |  |  |  | ●      | ●               |
| .1500           | 15.0                                           | 10       | 3.2 | 60 | 3 |              |  |        |  |  |  | ●      | ●               |
| .1650           | 16.5                                           | 10       | 3.2 | 60 | 3 |              |  |        |  |  |  | ●      | ●               |
| .1900           | 19.0                                           | 10       | 3.5 | 63 | 3 |              |  |        |  |  |  | ●      | ●               |
| .2050           | 20.5                                           | 10       | 3.5 | 63 | 3 |              |  |        |  |  |  | ●      | ●               |
| .2500           | 25.0                                           | 10       | 3.8 | 67 | 3 |              |  |        |  |  |  | ●      | ●               |
| .3100           | 31.0                                           | 12       | 4.2 | 71 | 3 |              |  |        |  |  |  | ●      | ●               |
| .9999           | Assortiment de fraises coniques contenant:     |          |     |    |   |              |  |        |  |  |  | ●      | ●               |
|                 | 1 pce. ø 6.3 / 8.3 / 10.4 / 12.4 / 16.5 / 20.5 |          |     |    |   |              |  |        |  |  |  |        |                 |
|                 |                                                |          |     |    |   |              |  |        |  |  |  |        |                 |
|                 |                                                |          |     |    |   |              |  |        |  |  |  |        |                 |
|                 |                                                |          |     |    |   |              |  |        |  |  |  |        |                 |



# Filetage métrique M

## Tolérance ISO 2 (6H)

N° EH0100 / EH0101



N° EH10310 / EH10311 s-tap



N° EH0502 / EH0503 x-tap



N° EH0570 / EH0571 x-tap



N° EH0580 / EH0581 x-tap



N° EH0590 x-tap-R



N° EH0591 x-tap-R



N° EH0512 / EH0513



N° EH0595 / EH0596 h-tap



N° EH6900 / EH6901 durotap H



N° ET0400 / ET0401 Inotap



N° ET0570 / ET0571 x-tap



N° ET0580 / ET0581 x-tap



N° ET0590 x-tap-R



N° ET0591 x-tap-R



N° EH0600 / EH0601 c-tap



|  |           |  |                 |  |     |
|--|-----------|--|-----------------|--|-----|
|  | HSS PM/F  |  | Rm <850         |  | 143 |
|  | HSS-E Co5 |  | Rm <850         |  | 145 |
|  | HSS PM/F  |  | Rm 850-1100     |  | 147 |
|  | HSS PM/F  |  | Rm 850-1100     |  | 149 |
|  | HSS PM/F  |  | Rm 850-1100     |  | 153 |
|  | HSS PM/F  |  | Rm 850-1100     |  | 155 |
|  | HSS PM/F  |  | Rm 850-1100     |  | 157 |
|  | HSS PM/F  |  | Rm 1100-1500    |  | 159 |
|  | HSS PM/F  |  | Rm 1100-1500    |  | 161 |
|  | HM MG10   |  | HRC 48- >60     |  | 163 |
|  | HSS PM/F  |  | Inox Stainless  |  | 165 |
|  | HSS PM/F  |  | Inox Stainless  |  | 167 |
|  | HSS PM/F  |  | Inox Stainless  |  | 169 |
|  | HSS PM/F  |  | Inox Stainless  |  | 171 |
|  | HSS PM/F  |  | Inox Stainless  |  | 173 |
|  | HSS PM/F  |  | GG(G) Cast iron |  | 175 |

M

# Filetage métrique M

## Tolérance ISO 2 (6H)

|                    |              |                                                                                    |
|--------------------|--------------|------------------------------------------------------------------------------------|
| N° EH0620 / EH0621 | c-tap        |    |
| N° EH6500          | durotap GG-R |    |
| N° EH6501          | durotap GG-R |    |
| N° EH6550 / EH6551 | durotap GG   |    |
| N° EI0020 / EI0021 |              |    |
| N° EI0050 / EI0051 |              |    |
| N° EH6300          | durotap A-R  |    |
| N° EH6301          | durotap A-R  |    |
| N° EH6350 / EH6351 | durotap A    |    |
| N° ET0705 / ET0706 | titap        |   |
| N° ET0755 / ET0756 | titap        |  |
| N° E0598           | n-tap        |  |
| N° EH0109          | polytap-R    |  |
| N° EH0110          | polytap-R    |  |
| N° EH0229          | polytap-R    |  |
| N° EH0230          | polytap-R    |  |

|                                                                                     |             |                                                                                     |                                 |                          |     |
|-------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------|---------------------------------|--------------------------|-----|
|    | HSS<br>PM/F |    | <b>GG(G)</b><br>Cast iron       |                          | 177 |
|    | HM<br>MG10  |    | <b>GG(G)</b><br>Cast iron       |                          | 179 |
|    | HM<br>MG10  |    | <b>GG(G)</b><br>Cast iron       |                          | 181 |
|    | HM<br>MG10  |    | <b>GG(G)</b><br>Cast iron       |                          | 183 |
|    | HSS<br>PM/F |    | <b>Al</b><br>Aluminium<br>Alloy | <b>Cu</b><br>Copper      | 185 |
|    | HSS<br>PM/F |    | <b>Al</b><br>Aluminium<br>Alloy | <b>Cu</b><br>Copper      | 187 |
|    | HM<br>MG10  |    | <b>Al</b><br>Aluminium<br>Cast  |                          | 189 |
|    | HM<br>MG10  |    | <b>Al</b><br>Aluminium<br>Cast  |                          | 191 |
|    | HM<br>MG10  |    | <b>Al</b><br>Aluminium<br>Cast  |                          | 193 |
|   | HSS<br>PM/F |   | <b>Ti</b><br>Titanium           |                          | 195 |
|  | HSS<br>PM/F |  | <b>Ti</b><br>Titanium           |                          | 199 |
|  | HSS<br>PM/F |  | <b>Ni</b><br>Nickel<br>Alloy    |                          | 201 |
|  | HSS<br>PM/F |  | <b>Rm</b><br><850-1100          | <b>Inox</b><br>Stainless | 203 |
|  | HSS<br>PM/F |  | <b>Rm</b><br><850-1100          | <b>Inox</b><br>Stainless | 205 |
|  | HSS<br>PM/F |  | <b>Rm</b><br><850-1100          | <b>Inox</b><br>Stainless | 207 |
|  | HSS<br>PM/F |  | <b>Rm</b><br><850-1100          | <b>Inox</b><br>Stainless | 209 |

# Filetage métrique M

## Tolérance ISO 2 (6H)

N° E10800 / E10801 u-tap



HSS-E  
Co5



Rm  
<850

211

N° E10820 / E10821 u-tap



HSS-E  
Co5



Rm  
<850

215

N° E10340 extra longue



HSS  
PM/F



Rm  
<850

219

N° E10350 extra longue



HSS  
PM/F



Rm  
<850

221

M

## Tolérance ISO 2 (6H) LH

N° E10122 / E10123



HSS-E  
Co5



Rm  
<850

223

N° E10222 / E10223



HSS-E  
Co5



Rm  
<850

225

## Tolérance ISO 2 +0.1

N° E10118 / E10119



HSS-E  
Co5



Rm  
<850

227

N° E10220 / E10221



HSS-E  
Co5



Rm  
<850

229

## Tolérance ISO 3 (6G)

N° EH0504 / EH0505 x-tap



HSS  
PM/F



Rm  
850-1100

231

N° EH0572 / EH0573 x-tap



HSS  
PM/F



Rm  
850-1100

233

## Tolérance ISO 1 (4H)

N° E10110



HSS-E  
Co5



Rm  
<850

235

N° E10214



HSS-E  
Co5



Rm  
<850

237

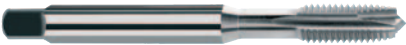




Filetage métrique M / MJ

Tolérance 7G

N° E10114 / E10115



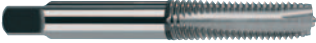
|  |              |  |            |  |     |
|--|--------------|--|------------|--|-----|
|  | HSS-E<br>Co5 |  | Rm<br><850 |  | 239 |
|  | HSS-E<br>Co5 |  | Rm<br><850 |  | 241 |

N° E10218 / E10219



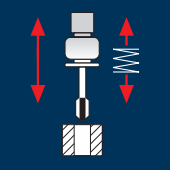
MJ Tolérance 4H

N° E0599



|  |             |  |                       |  |     |
|--|-------------|--|-----------------------|--|-----|
|  | HSS<br>PM/F |  | Ni<br>Nickel<br>Alloy |  | 243 |
|--|-------------|--|-----------------------|--|-----|

M

| Application                                                                      | Matières                              | M     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>3.0 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|----------------------------------------------------------------------------------|---------------------------------------|-------|-----------|-----------|-----------------------------|---------------------------|-----------------|-----------------------------|---------------------------|-----------------|-----------------------------|---------------------------|-----------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>     | M 2   | 2.0       | 0.40      | 28                          | 4455                      | 1782            | 23                          | 3660                      | 1464            | 18                          | 2865                      | 1146            |
|                                                                                  |                                       | M 2.5 | 2.5       | 0.45      | 28                          | 3565                      | 1604            | 23                          | 2930                      | 1319            | 18                          | 2290                      | 1031            |
|                                                                                  |                                       | M 3   | 3.0       | 0.50      | 28                          | 2970                      | 1485            | 23                          | 2440                      | 1220            | 18                          | 1910                      | 955             |
|                                                                                  |                                       | M 4   | 4.0       | 0.70      | 28                          | 2230                      | 1561            | 23                          | 1830                      | 1281            | 18                          | 1430                      | 1001            |
|                                                                                  |                                       | M 5   | 5.0       | 0.80      | 28                          | 1785                      | 1428            | 23                          | 1465                      | 1172            | 18                          | 1145                      | 916             |
|                                                                                  |                                       | M 6   | 6.0       | 1.00      | 28                          | 1485                      | 1485            | 23                          | 1220                      | 1220            | 18                          | 955                       | 955             |
|                                                                                  |                                       | M 8   | 8.0       | 1.25      | 28                          | 1115                      | 1394            | 23                          | 915                       | 1144            | 18                          | 715                       | 894             |
|                                                                                  |                                       | M10   | 10.0      | 1.50      | 28                          | 890                       | 1335            | 23                          | 730                       | 1095            | 18                          | 575                       | 863             |
|                                                                                  |                                       | M12   | 12.0      | 1.75      | 28                          | 745                       | 1304            | 23                          | 610                       | 1068            | 18                          | 475                       | 831             |
|                                                                                  |                                       |       |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                  | Aciers<br>< 500 N/mm <sup>2</sup>     | M14   | 14.0      | 2.00      | 28                          | 635                       | 1270            | 23                          | 525                       | 1050            | 18                          | 410                       | 820             |
|                                                                                  |                                       | M16   | 16.0      | 2.00      | 28                          | 555                       | 1110            | 23                          | 460                       | 920             | 18                          | 360                       | 720             |
|                                                                                  |                                       | M18   | 18.0      | 2.50      | 28                          | 495                       | 1238            | 23                          | 405                       | 1013            | 18                          | 320                       | 800             |
|                                                                                  |                                       | M20   | 20.0      | 2.50      | 28                          | 445                       | 1113            | 23                          | 365                       | 913             | 18                          | 285                       | 713             |
|                                                                                  |                                       | M22   | 22.0      | 2.50      | 28                          | 405                       | 1013            | 23                          | 335                       | 838             | 18                          | 260                       | 650             |
|                                                                                  |                                       | M24   | 24.0      | 3.00      | 28                          | 370                       | 1110            | 23                          | 305                       | 915             | 18                          | 240                       | 720             |
|                                                                                  |                                       |       |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                  |                                       |       |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup> | M 2   | 2.0       | 0.40      | 25                          | 3980                      | 1592            | 20                          | 3185                      | 1274            | 15                          | 2385                      | 954             |
|                                                                                  |                                       | M 2.5 | 2.5       | 0.45      | 25                          | 3185                      | 1433            | 20                          | 2545                      | 1145            | 15                          | 1910                      | 860             |
|                                                                                  |                                       | M 3   | 3.0       | 0.50      | 25                          | 2655                      | 1328            | 20                          | 2120                      | 1060            | 15                          | 1590                      | 795             |
|                                                                                  |                                       | M 4   | 4.0       | 0.70      | 25                          | 1990                      | 1393            | 20                          | 1590                      | 1113            | 15                          | 1195                      | 837             |
|                                                                                  |                                       | M 5   | 5.0       | 0.80      | 25                          | 1590                      | 1272            | 20                          | 1275                      | 1020            | 15                          | 955                       | 764             |
|                                                                                  |                                       | M 6   | 6.0       | 1.00      | 25                          | 1325                      | 1325            | 20                          | 1060                      | 1060            | 15                          | 795                       | 795             |
|                                                                                  |                                       | M 8   | 8.0       | 1.25      | 25                          | 995                       | 1244            | 20                          | 795                       | 994             | 15                          | 595                       | 744             |
|                                                                                  |                                       | M10   | 10.0      | 1.50      | 25                          | 795                       | 1193            | 20                          | 635                       | 953             | 15                          | 475                       | 713             |
|                                                                                  |                                       | M12   | 12.0      | 1.75      | 25                          | 665                       | 1164            | 20                          | 530                       | 928             | 15                          | 400                       | 700             |
|                                                                                  |                                       |       |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                  |                                       |       |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                  |                                       |       |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup> | M14   | 14.0      | 2.00      | 25                          | 570                       | 1140            | 20                          | 455                       | 910             | 15                          | 340                       | 680             |
|                                                                                  |                                       | M16   | 16.0      | 2.00      | 25                          | 495                       | 990             | 20                          | 400                       | 800             | 15                          | 300                       | 600             |
|                                                                                  |                                       | M18   | 18.0      | 2.50      | 25                          | 440                       | 1100            | 20                          | 355                       | 888             | 15                          | 265                       | 663             |
|                                                                                  |                                       | M20   | 20.0      | 2.50      | 25                          | 400                       | 1000            | 20                          | 320                       | 800             | 15                          | 240                       | 600             |
|                                                                                  |                                       | M22   | 22.0      | 2.50      | 25                          | 360                       | 900             | 20                          | 290                       | 725             | 15                          | 215                       | 538             |
|                                                                                  |                                       | M24   | 24.0      | 3.00      | 25                          | 330                       | 990             | 20                          | 265                       | 795             | 15                          | 200                       | 600             |
|                                                                                  |                                       |       |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                  |                                       |       |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |

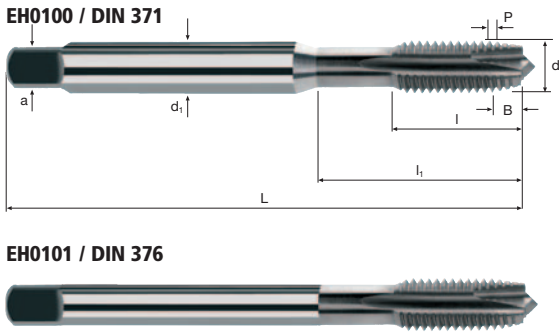
M

ISO 2  
(6H)

HSS  
PM/F

DIN  
371/376

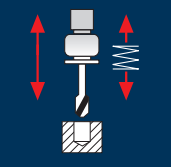
Form B



|             |                |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|

| Exemple: N° cde |       |      |     |    |      |      |     |   |      | TiCN   |
|-----------------|-------|------|-----|----|------|------|-----|---|------|--------|
| N° d'article    |       |      |     |    |      |      |     |   |      | EH0100 |
| Code-ø          |       |      |     |    |      |      |     |   |      |        |
| ø<br>Code       | d     | P    | L   | l  | l1   | d1   | a   |   |      |        |
| .034            | M 2   | 0.40 | 45  | 8  | —    | 2.8  | 2.1 | 2 | 1.60 | ●      |
| .040            | M 2.5 | 0.45 | 50  | 9  | —    | 2.8  | 2.1 | 2 | 2.05 | ●      |
| .044            | M 3   | 0.50 | 56  | 12 | 18.0 | 3.5  | 2.7 | 3 | 2.50 | ●      |
| .058            | M 4   | 0.70 | 63  | 13 | 21.0 | 4.5  | 3.4 | 3 | 3.30 | ●      |
| .084            | M 5   | 0.80 | 70  | 15 | 25.0 | 6.0  | 4.9 | 3 | 4.20 | ●      |
| .088            | M 6   | 1.00 | 80  | 17 | 30.0 | 6.0  | 4.9 | 3 | 5.00 | ●      |
| .160            | M 8   | 1.25 | 90  | 20 | 35.0 | 8.0  | 6.2 | 3 | 6.80 | ●      |
| .174            | M10   | 1.50 | 100 | 22 | 39.0 | 10.0 | 8.0 | 3 | 8.50 | ●      |

| Exemple: N° cde |     |      |     |    |      |      |      |   |       | TiCN   |
|-----------------|-----|------|-----|----|------|------|------|---|-------|--------|
| N° d'article    |     |      |     |    |      |      |      |   |       | EH0101 |
| Code-ø          |     |      |     |    |      |      |      |   |       |        |
| ø<br>Code       | d   | P    | L   | l  | l1   | d1   | a    |   |       |        |
| .240            | M12 | 1.75 | 110 | 24 | 40.0 | 9.0  | 7.0  | 3 | 10.20 | ●      |
| .244            | M14 | 2.00 | 110 | 26 | 40.0 | 11.0 | 9.0  | 3 | 12.00 | ●      |
| .246            | M16 | 2.00 | 110 | 27 | 40.0 | 12.0 | 9.0  | 3 | 14.00 | ●      |
| .312            | M18 | 2.50 | 125 | 30 | 45.0 | 14.0 | 11.0 | 4 | 15.50 | ●      |
| .314            | M20 | 2.50 | 140 | 32 | 50.0 | 16.0 | 12.0 | 4 | 17.50 | ●      |
| .316            | M22 | 2.50 | 140 | 32 | 50.0 | 18.0 | 14.5 | 4 | 19.50 | ●      |
| .320            | M24 | 3.00 | 160 | 34 | 60.0 | 18.0 | 14.5 | 4 | 21.00 | ●      |

| Application                                                                      | Matières                              | M     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[m·min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[m·min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[m·min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|----------------------------------------------------------------------------------|---------------------------------------|-------|-----------|-----------|--------------------------------------------|---------------------------|-----------------|--------------------------------------------|---------------------------|-----------------|--------------------------------------------|---------------------------|-----------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>     | M 2   | 2.0       | 0.40      | 25                                         | 3980                      | 1592            | 20                                         | 3185                      | 1274            | 18                                         | 2865                      | 1146            |
|                                                                                  |                                       | M 2.5 | 2.5       | 0.45      | 25                                         | 3185                      | 1433            | 20                                         | 2545                      | 1145            | 18                                         | 2290                      | 1031            |
|                                                                                  |                                       | M 3   | 3.0       | 0.50      | 25                                         | 2655                      | 1328            | 20                                         | 2120                      | 1060            | 18                                         | 1910                      | 955             |
|                                                                                  |                                       | M 4   | 4.0       | 0.70      | 25                                         | 1990                      | 1393            | 20                                         | 1590                      | 1113            | 18                                         | 1430                      | 1001            |
|                                                                                  |                                       | M 5   | 5.0       | 0.80      | 25                                         | 1590                      | 1272            | 20                                         | 1275                      | 1020            | 18                                         | 1145                      | 916             |
|                                                                                  |                                       | M 6   | 6.0       | 1.00      | 25                                         | 1325                      | 1325            | 20                                         | 1060                      | 1060            | 18                                         | 955                       | 955             |
|                                                                                  |                                       | M 8   | 8.0       | 1.25      | 25                                         | 995                       | 1244            | 20                                         | 795                       | 994             | 18                                         | 715                       | 894             |
|                                                                                  |                                       | M10   | 10.0      | 1.50      | 25                                         | 795                       | 1193            | 20                                         | 635                       | 953             | 18                                         | 575                       | 863             |
|                                                                                  |                                       | M12   | 12.0      | 1.75      | 25                                         | 665                       | 1164            | 20                                         | 530                       | 928             | 18                                         | 475                       | 831             |
|                                                                                  |                                       |       |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|                                                                                  |                                       |       |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|                                                                                  |                                       |       |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|                                                                                  | Aciers<br>< 500 N/mm <sup>2</sup>     | M14   | 14.0      | 2.00      | 25                                         | 570                       | 1140            | 20                                         | 455                       | 910             | 18                                         | 410                       | 820             |
|                                                                                  |                                       | M16   | 16.0      | 2.00      | 25                                         | 495                       | 990             | 20                                         | 400                       | 800             | 18                                         | 360                       | 720             |
|                                                                                  |                                       | M18   | 18.0      | 2.50      | 25                                         | 440                       | 1100            | 20                                         | 355                       | 888             | 18                                         | 320                       | 800             |
|                                                                                  |                                       | M20   | 20.0      | 2.50      | 25                                         | 400                       | 1000            | 20                                         | 320                       | 800             | 18                                         | 285                       | 713             |
|                                                                                  |                                       | M22   | 22.0      | 2.50      | 25                                         | 360                       | 900             | 20                                         | 290                       | 725             | 18                                         | 260                       | 650             |
|                                                                                  |                                       | M24   | 24.0      | 3.00      | 25                                         | 330                       | 990             | 20                                         | 265                       | 795             | 18                                         | 240                       | 720             |
|                                                                                  |                                       |       |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|                                                                                  |                                       |       |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup> | M 2   | 2.0       | 0.40      | 16                                         | 2545                      | 1018            | 14                                         | 2230                      | 892             | 12                                         | 1910                      | 764             |
|                                                                                  |                                       | M 2.5 | 2.5       | 0.45      | 16                                         | 2035                      | 916             | 14                                         | 1785                      | 803             | 12                                         | 1530                      | 689             |
|                                                                                  |                                       | M 3   | 3.0       | 0.50      | 16                                         | 1700                      | 850             | 14                                         | 1485                      | 743             | 12                                         | 1275                      | 638             |
|                                                                                  |                                       | M 4   | 4.0       | 0.70      | 16                                         | 1275                      | 893             | 14                                         | 1115                      | 781             | 12                                         | 955                       | 669             |
|                                                                                  |                                       | M 5   | 5.0       | 0.80      | 16                                         | 1020                      | 816             | 14                                         | 890                       | 712             | 12                                         | 765                       | 612             |
|                                                                                  |                                       | M 6   | 6.0       | 1.00      | 16                                         | 850                       | 850             | 14                                         | 745                       | 745             | 12                                         | 635                       | 635             |
|                                                                                  |                                       | M 8   | 8.0       | 1.25      | 16                                         | 635                       | 794             | 14                                         | 555                       | 694             | 12                                         | 475                       | 594             |
|                                                                                  |                                       | M10   | 10.0      | 1.50      | 16                                         | 510                       | 765             | 14                                         | 445                       | 668             | 12                                         | 380                       | 570             |
|                                                                                  |                                       | M12   | 12.0      | 1.75      | 16                                         | 425                       | 744             | 14                                         | 370                       | 648             | 12                                         | 320                       | 560             |
|                                                                                  |                                       |       |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|                                                                                  |                                       |       |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|                                                                                  |                                       |       |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup> | M14   | 14.0      | 2.00      | 16                                         | 365                       | 730             | 14                                         | 320                       | 640             | 12                                         | 275                       | 550             |
|                                                                                  |                                       | M16   | 16.0      | 2.00      | 16                                         | 320                       | 640             | 14                                         | 280                       | 560             | 12                                         | 240                       | 480             |
|                                                                                  |                                       | M18   | 18.0      | 2.50      | 16                                         | 285                       | 713             | 14                                         | 250                       | 625             | 12                                         | 210                       | 525             |
|                                                                                  |                                       | M20   | 20.0      | 2.50      | 16                                         | 255                       | 638             | 14                                         | 225                       | 563             | 12                                         | 190                       | 475             |
|                                                                                  |                                       | M22   | 22.0      | 2.50      | 16                                         | 230                       | 575             | 14                                         | 205                       | 513             | 12                                         | 175                       | 438             |
|                                                                                  |                                       | M24   | 24.0      | 3.00      | 16                                         | 210                       | 630             | 14                                         | 185                       | 555             | 12                                         | 160                       | 480             |
|                                                                                  |                                       |       |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|                                                                                  |                                       |       |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |

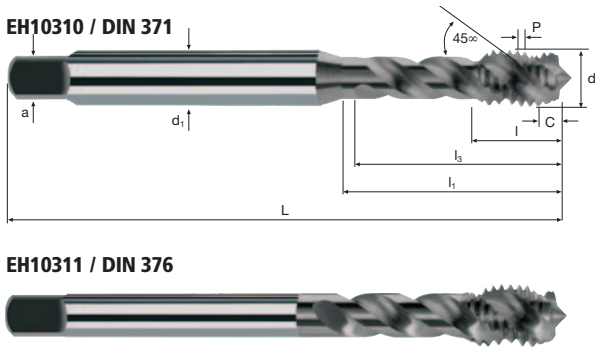
M

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(6H)

HSS-E  
Co5

DIN  
371/376

Form C



|             |                |  |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 |  |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|--|

| Exemple: N° cde <b>EH10310</b> N° d'article <b>.034</b> Code-ø |       |      |     |      |      |      |      |     |   |      | TiCN           |
|----------------------------------------------------------------|-------|------|-----|------|------|------|------|-----|---|------|----------------|
|                                                                |       |      |     |      |      |      |      |     |   |      | <b>EH10310</b> |
| Ø<br>Code                                                      | d     | P    | L   | l    | l1   | l3   | d1   | a   |   |      |                |
| .034                                                           | M 2   | 0.40 | 45  | 8.0  | —    | 10.5 | 2.8  | 2.1 | 3 | 1.60 | ●              |
| .040                                                           | M 2.5 | 0.45 | 50  | 9.0  | —    | 13.0 | 2.8  | 2.1 | 3 | 2.05 | ●              |
| .044                                                           | M 3   | 0.50 | 56  | 4.0  | 18.0 | 16.0 | 3.5  | 2.7 | 3 | 2.50 | ●              |
| .058                                                           | M 4   | 0.70 | 63  | 5.6  | 21.0 | 19.0 | 4.5  | 3.4 | 3 | 3.30 | ●              |
| .084                                                           | M 5   | 0.80 | 70  | 6.4  | 25.0 | 23.0 | 6.0  | 4.9 | 3 | 4.20 | ●              |
| .088                                                           | M 6   | 1.00 | 80  | 8.0  | 30.0 | 28.0 | 6.0  | 4.9 | 3 | 5.00 | ●              |
| .160                                                           | M 8   | 1.25 | 90  | 10.0 | 35.0 | 33.0 | 8.0  | 6.2 | 3 | 6.80 | ●              |
| .174                                                           | M10   | 1.50 | 100 | 12.0 | 39.0 | 37.0 | 10.0 | 8.0 | 3 | 8.50 | ●              |

| Exemple: N° cde <b>EH10311</b> N° d'article <b>.240</b> Code-ø |     |      |     |      |      |      |      |      |   |       | TiCN           |
|----------------------------------------------------------------|-----|------|-----|------|------|------|------|------|---|-------|----------------|
|                                                                |     |      |     |      |      |      |      |      |   |       | <b>EH10311</b> |
| Ø<br>Code                                                      | d   | P    | L   | l    | l1   | l3   | d1   | a    |   |       |                |
| .240                                                           | M12 | 1.75 | 110 | 14.0 | 50.0 | 48.0 | 9.0  | 7.0  | 3 | 10.20 | ●              |
| .244                                                           | M14 | 2.00 | 110 | 16.0 | 58.0 | 56.0 | 11.0 | 9.0  | 4 | 12.00 | ●              |
| .246                                                           | M16 | 2.00 | 110 | 16.0 | 58.0 | 56.0 | 12.0 | 9.0  | 4 | 14.00 | ●              |
| .312                                                           | M18 | 2.50 | 125 | 20.0 | 65.0 | 63.0 | 14.0 | 11.0 | 4 | 15.50 | ●              |
| .314                                                           | M20 | 2.50 | 140 | 20.0 | 72.0 | 70.0 | 16.0 | 12.0 | 4 | 17.50 | ●              |
| .316                                                           | M22 | 2.50 | 140 | 20.0 | 72.0 | 70.0 | 18.0 | 14.5 | 4 | 19.50 | ●              |
| .320                                                           | M24 | 3.00 | 160 | 24.0 | 74.0 | 72.0 | 18.0 | 14.5 | 4 | 21.00 | ●              |

| Application                                     | Matières                                        |       |      |         |                      |                      |         |                      |                      |         |  |  |
|-------------------------------------------------|-------------------------------------------------|-------|------|---------|----------------------|----------------------|---------|----------------------|----------------------|---------|--|--|
|                                                 | Aciers<br>500 - 850 N/mm <sup>2</sup>           | M     | ø    | P       | $v_c$                | n                    | $v_f$   | $v_c$                | n                    | $v_f$   |  |  |
|                                                 |                                                 | [mm]  | [mm] | 1.5 x d | [min <sup>-1</sup> ] | [100%]               | 2.0 x d | [min <sup>-1</sup> ] | [100%]               | 3.0 x d |  |  |
|                                                 |                                                 | M 2   | 2.0  | 0.40    | 25                   | 3980                 | 1592    | 20                   | 3185                 | 1274    |  |  |
|                                                 |                                                 | M 2.5 | 2.5  | 0.45    | 25                   | 3185                 | 1433    | 20                   | 2545                 | 1145    |  |  |
|                                                 |                                                 | M 3   | 3.0  | 0.50    | 25                   | 2655                 | 1328    | 20                   | 2120                 | 1060    |  |  |
|                                                 |                                                 | M 4   | 4.0  | 0.70    | 25                   | 1990                 | 1393    | 20                   | 1590                 | 1113    |  |  |
|                                                 |                                                 | M 5   | 5.0  | 0.80    | 25                   | 1590                 | 1272    | 20                   | 1275                 | 1020    |  |  |
|                                                 |                                                 | M 6   | 6.0  | 1.00    | 25                   | 1325                 | 1325    | 20                   | 1060                 | 1060    |  |  |
|                                                 |                                                 | M 8   | 8.0  | 1.25    | 25                   | 995                  | 1244    | 20                   | 795                  | 994     |  |  |
|                                                 |                                                 | M10   | 10.0 | 1.50    | 25                   | 795                  | 1193    | 20                   | 635                  | 953     |  |  |
|                                                 | Aciers<br>500 - 850 N/mm <sup>2</sup>           | M12   | 12.0 | 1.75    | 25                   | 665                  | 1164    | 20                   | 530                  | 928     |  |  |
|                                                 |                                                 | M14   | 14.0 | 2.00    | 25                   | 570                  | 1140    | 20                   | 455                  | 910     |  |  |
|                                                 |                                                 | M16   | 16.0 | 2.00    | 25                   | 495                  | 990     | 20                   | 400                  | 800     |  |  |
|                                                 |                                                 | M18   | 18.0 | 2.50    | 25                   | 440                  | 1100    | 20                   | 355                  | 888     |  |  |
|                                                 |                                                 | M20   | 20.0 | 2.50    | 25                   | 400                  | 1000    | 20                   | 320                  | 800     |  |  |
|                                                 |                                                 | M22   | 22.0 | 2.50    | 25                   | 360                  | 900     | 20                   | 290                  | 725     |  |  |
|                                                 |                                                 | M24   | 24.0 | 3.00    | 25                   | 330                  | 990     | 20                   | 265                  | 795     |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 | Aciers<br>850 - 1100 N/mm <sup>2</sup>          | M 2   | 2.0  | 0.40    | 20                   | 3185                 | 1274    | 15                   | 2385                 | 954     |  |  |
|                                                 |                                                 | M 2.5 | 2.5  | 0.45    | 20                   | 2545                 | 1145    | 15                   | 1910                 | 860     |  |  |
|                                                 |                                                 | M 3   | 3.0  | 0.50    | 20                   | 2120                 | 1060    | 15                   | 1590                 | 795     |  |  |
|                                                 |                                                 | M 4   | 4.0  | 0.70    | 20                   | 1590                 | 1113    | 15                   | 1195                 | 837     |  |  |
|                                                 |                                                 | M 5   | 5.0  | 0.80    | 20                   | 1275                 | 1020    | 15                   | 955                  | 764     |  |  |
|                                                 |                                                 | M 6   | 6.0  | 1.00    | 20                   | 1060                 | 1060    | 15                   | 795                  | 795     |  |  |
|                                                 |                                                 | M 8   | 8.0  | 1.25    | 20                   | 795                  | 994     | 15                   | 595                  | 744     |  |  |
|                                                 |                                                 | M10   | 10.0 | 1.50    | 20                   | 635                  | 953     | 15                   | 475                  | 713     |  |  |
|                                                 |                                                 | M12   | 12.0 | 1.75    | 20                   | 530                  | 928     | 15                   | 400                  | 700     |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 | Aciers<br>850 - 1100 N/mm <sup>2</sup>          | M14   | 14.0 | 2.00    | 20                   | 455                  | 910     | 15                   | 340                  | 680     |  |  |
|                                                 |                                                 | M16   | 16.0 | 2.00    | 20                   | 400                  | 800     | 15                   | 300                  | 600     |  |  |
|                                                 |                                                 | M18   | 18.0 | 2.50    | 20                   | 355                  | 888     | 15                   | 265                  | 663     |  |  |
|                                                 |                                                 | M20   | 20.0 | 2.50    | 20                   | 320                  | 800     | 15                   | 240                  | 600     |  |  |
|                                                 |                                                 | M22   | 22.0 | 2.50    | 20                   | 290                  | 725     | 15                   | 215                  | 538     |  |  |
|                                                 |                                                 | M24   | 24.0 | 3.00    | 20                   | 265                  | 795     | 15                   | 200                  | 600     |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
| Matières                                        |                                                 | M     | ø    | P       | $v_c$                | n                    | $v_f$   | $v_c$                | n                    | $v_f$   |  |  |
|                                                 |                                                 |       | [mm] | [mm]    | 1.5 x d              | [min <sup>-1</sup> ] | [100%]  | 2.0 x d              | [min <sup>-1</sup> ] | [100%]  |  |  |
| Aciers<br>1100 - 1300 N/mm <sup>2</sup><br><br> |                                                 | M 2   | 2.0  | 0.40    | 7                    | 1115                 | 446     | 4                    | 635                  | 254     |  |  |
|                                                 |                                                 | M 2.5 | 2.5  | 0.45    | 7                    | 890                  | 401     | 4                    | 510                  | 230     |  |  |
|                                                 |                                                 | M 3   | 3.0  | 0.50    | 7                    | 745                  | 373     | 4                    | 425                  | 213     |  |  |
|                                                 |                                                 | M 4   | 4.0  | 0.70    | 7                    | 555                  | 389     | 4                    | 320                  | 224     |  |  |
|                                                 |                                                 | M 5   | 5.0  | 0.80    | 7                    | 445                  | 356     | 4                    | 255                  | 204     |  |  |
|                                                 |                                                 | M 6   | 6.0  | 1.00    | 7                    | 370                  | 370     | 4                    | 210                  | 210     |  |  |
|                                                 |                                                 | M 8   | 8.0  | 1.25    | 7                    | 280                  | 350     | 4                    | 160                  | 200     |  |  |
|                                                 |                                                 | M10   | 10.0 | 1.50    | 7                    | 225                  | 338     | 4                    | 125                  | 188     |  |  |
|                                                 |                                                 | M12   | 12.0 | 1.75    | 7                    | 185                  | 324     | 4                    | 105                  | 184     |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 | Aciers<br>1100 - 1300 N/mm <sup>2</sup><br><br> | M14   | 14.0 | 2.00    | 7                    | 160                  | 320     | 4                    | 90                   | 180     |  |  |
|                                                 |                                                 | M16   | 16.0 | 2.00    | 7                    | 140                  | 280     | 4                    | 80                   | 160     |  |  |
|                                                 |                                                 | M18   | 18.0 | 2.50    | 7                    | 125                  | 313     | 4                    | 70                   | 175     |  |  |
|                                                 |                                                 | M20   | 20.0 | 2.50    | 7                    | 110                  | 275     | 4                    | 65                   | 163     |  |  |
|                                                 |                                                 | M22   | 22.0 | 2.50    | 7                    | 100                  | 250     | 4                    | 60                   | 150     |  |  |
|                                                 |                                                 | M24   | 24.0 | 3.00    | 7                    | 95                   | 285     | 4                    | 55                   | 165     |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
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|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |
|                                                 |                                                 |       |      |         |                      |                      |         |                      |                      |         |  |  |

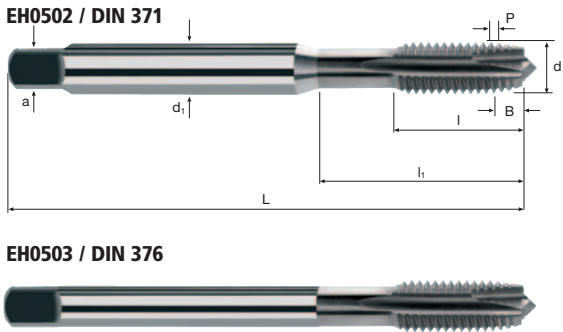
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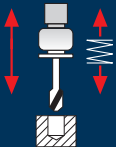
Form B



|             |                |                 |  |  |  |  |  |  |  |  |
|-------------|----------------|-----------------|--|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  |  |  |  |  |
|-------------|----------------|-----------------|--|--|--|--|--|--|--|--|

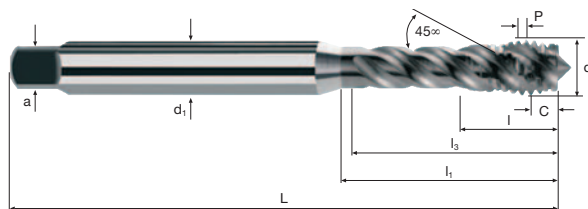
| Exemple: N° cde |       |      |     |    |      |      |     |   |      | TiCN   |   |
|-----------------|-------|------|-----|----|------|------|-----|---|------|--------|---|
| N° d'article    |       |      |     |    |      |      |     |   |      | EH0502 |   |
| Code-ø          |       |      |     |    |      |      |     |   |      |        |   |
| Ø<br>Code       | d     | P    | L   | l  | l1   | d1   | a   |   |      |        |   |
| .034            | M 2   | 0.40 | 45  | 8  | —    | 2.8  | 2.1 | 2 | 1.60 |        | ● |
| .040            | M 2.5 | 0.45 | 50  | 9  | —    | 2.8  | 2.1 | 2 | 2.05 |        | ● |
| .044            | M 3   | 0.50 | 56  | 12 | 18.0 | 3.5  | 2.7 | 3 | 2.50 |        | ● |
| .058            | M 4   | 0.70 | 63  | 13 | 21.0 | 4.5  | 3.4 | 3 | 3.30 |        | ● |
| .084            | M 5   | 0.80 | 70  | 15 | 25.0 | 6.0  | 4.9 | 3 | 4.20 |        | ● |
| .088            | M 6   | 1.00 | 80  | 17 | 30.0 | 6.0  | 4.9 | 3 | 5.00 |        | ● |
| .160            | M 8   | 1.25 | 90  | 20 | 35.0 | 8.0  | 6.2 | 3 | 6.80 |        | ● |
| .174            | M10   | 1.50 | 100 | 22 | 39.0 | 10.0 | 8.0 | 3 | 8.50 |        | ● |

| Exemple: N° cde |     |      |     |    |      |      |      |   |       | TiCN   |   |
|-----------------|-----|------|-----|----|------|------|------|---|-------|--------|---|
| N° d'article    |     |      |     |    |      |      |      |   |       | EH0503 |   |
| Code-ø          |     |      |     |    |      |      |      |   |       |        |   |
| Ø<br>Code       | d   | P    | L   | l  | l1   | d1   | a    |   |       |        |   |
| .240            | M12 | 1.75 | 110 | 24 | 40.0 | 9.0  | 7.0  | 3 | 10.20 |        | ● |
| .244            | M14 | 2.00 | 110 | 26 | 40.0 | 11.0 | 9.0  | 3 | 12.00 |        | ● |
| .246            | M16 | 2.00 | 110 | 27 | 40.0 | 12.0 | 9.0  | 3 | 14.00 |        | ● |
| .312            | M18 | 2.50 | 125 | 30 | 45.0 | 14.0 | 11.0 | 4 | 15.50 |        | ● |
| .314            | M20 | 2.50 | 140 | 32 | 50.0 | 16.0 | 12.0 | 4 | 17.50 |        | ● |
| .316            | M22 | 2.50 | 140 | 32 | 50.0 | 18.0 | 14.5 | 4 | 19.50 |        | ● |
| .320            | M24 | 3.00 | 160 | 34 | 60.0 | 18.0 | 14.5 | 4 | 21.00 |        | ● |

| Application                                                                       | Matières                  |       |      |         |         |        |         |         |        |         |         |        |       |
|-----------------------------------------------------------------------------------|---------------------------|-------|------|---------|---------|--------|---------|---------|--------|---------|---------|--------|-------|
|  | Aciers<br>500 - 850 N/mm² | M     | ø    | P       | $v_c$   | n      | $v_f$   | $v_c$   | n      | $v_f$   | $v_c$   | n      | $v_f$ |
|                                                                                   |                           | [mm]  | [mm] | 1.0 x d | [min⁻¹] | [100%] | 1.5 x d | [min⁻¹] | [100%] | 2.0 x d | [min⁻¹] | [100%] |       |
|                                                                                   |                           | M 2   | 2.0  | 0.40    | 32      | 5095   | 2038    | 28      | 4455   | 1782    | 22      | 3500   | 1400  |
|                                                                                   |                           | M 2.5 | 2.5  | 0.45    | 32      | 4075   | 1834    | 28      | 3565   | 1604    | 22      | 2800   | 1260  |
|                                                                                   |                           | M 3   | 3.0  | 0.50    | 32      | 3395   | 1698    | 28      | 2970   | 1485    | 22      | 2335   | 1168  |
|                                                                                   |                           | M 4   | 4.0  | 0.70    | 32      | 2545   | 1782    | 28      | 2230   | 1561    | 22      | 1750   | 1225  |
|                                                                                   |                           | M 5   | 5.0  | 0.80    | 32      | 2035   | 1628    | 28      | 1785   | 1428    | 22      | 1400   | 1120  |
|                                                                                   |                           | M 6   | 6.0  | 1.00    | 32      | 1700   | 1700    | 28      | 1485   | 1485    | 22      | 1165   | 1165  |
|                                                                                   |                           | M 8   | 8.0  | 1.25    | 32      | 1275   | 1594    | 28      | 1115   | 1394    | 22      | 875    | 1094  |
|                                                                                   |                           | M10   | 10.0 | 1.50    | 32      | 1020   | 1530    | 28      | 890    | 1335    | 22      | 700    | 1050  |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |
|                                                                                   |                           |       |      |         |         |        |         |         |        |         |         |        |       |



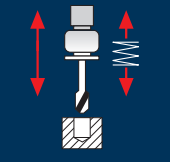
Form C



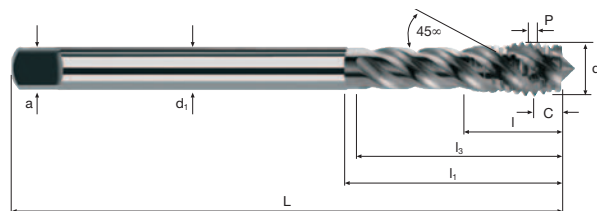
M

**Rm**  
850-1100

149

| Application                                                                      | Matières                               | M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>$1.0 \times d$ | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>$1.5 \times d$ | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>$2.0 \times d$ | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|----------------------------------------------------------------------------------|----------------------------------------|-----|-----------|-----------|-------------------------|---------------------------|-----------------|-------------------------|---------------------------|-----------------|-------------------------|---------------------------|-----------------|
|  | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M12 | 12.0      | 1.75      | 32                      | 850                       | 1488            | 28                      | 745                       | 1304            | 22                      | 585                       | 1024            |
|                                                                                  |                                        | M14 | 14.0      | 2.00      | 32                      | 730                       | 1460            | 28                      | 635                       | 1270            | 22                      | 500                       | 1000            |
|                                                                                  |                                        | M16 | 16.0      | 2.00      | 32                      | 635                       | 1270            | 28                      | 555                       | 1110            | 22                      | 440                       | 880             |
|                                                                                  |                                        | M18 | 18.0      | 2.50      | 32                      | 565                       | 1413            | 28                      | 495                       | 1238            | 22                      | 390                       | 975             |
|                                                                                  |                                        | M20 | 20.0      | 2.50      | 32                      | 510                       | 1275            | 28                      | 445                       | 1113            | 22                      | 350                       | 875             |
|                                                                                  |                                        | M22 | 22.0      | 2.50      | 32                      | 465                       | 1163            | 28                      | 405                       | 1013            | 22                      | 320                       | 800             |
|                                                                                  |                                        | M24 | 24.0      | 3.00      | 32                      | 425                       | 1275            | 28                      | 370                       | 1110            | 22                      | 290                       | 870             |
|                                                                                  |                                        | M27 | 27.0      | 3.00      | 32                      | 375                       | 1125            | 28                      | 330                       | 990             | 22                      | 260                       | 780             |
|                                                                                  |                                        | M30 | 30.0      | 3.50      | 32                      | 340                       | 1190            | 28                      | 295                       | 1033            | 22                      | 235                       | 823             |
|                                                                                  |                                        |     |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M33 | 33.0      | 3.50      | 32                      | 310                       | 1085            | 28                      | 270                       | 945             | 22                      | 210                       | 735             |
|                                                                                  |                                        | M36 | 36.0      | 4.00      | 32                      | 285                       | 1140            | 28                      | 250                       | 1000            | 22                      | 195                       | 780             |
|                                                                                  |                                        | M39 | 39.0      | 4.00      | 32                      | 260                       | 1040            | 28                      | 230                       | 920             | 22                      | 180                       | 720             |
|                                                                                  |                                        | M42 | 42.0      | 4.50      | 32                      | 245                       | 1103            | 28                      | 210                       | 945             | 22                      | 165                       | 743             |
|                                                                                  |                                        |     |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|                                                                                  | Aciers<br>850 - 1100 N/mm <sup>2</sup> | M12 | 12.0      | 1.75      | 20                      | 530                       | 928             | 16                      | 425                       | 744             | 10                      | 265                       | 464             |
|                                                                                  |                                        | M14 | 14.0      | 2.00      | 20                      | 455                       | 910             | 16                      | 365                       | 730             | 10                      | 225                       | 450             |
|                                                                                  |                                        | M16 | 16.0      | 2.00      | 20                      | 400                       | 800             | 16                      | 320                       | 640             | 10                      | 200                       | 400             |
|                                                                                  |                                        | M18 | 18.0      | 2.50      | 20                      | 355                       | 888             | 16                      | 285                       | 713             | 10                      | 175                       | 438             |
|                                                                                  |                                        | M20 | 20.0      | 2.50      | 20                      | 320                       | 800             | 16                      | 255                       | 638             | 10                      | 160                       | 400             |
|                                                                                  |                                        | M22 | 22.0      | 2.50      | 20                      | 290                       | 725             | 16                      | 230                       | 575             | 10                      | 145                       | 363             |
|                                                                                  |                                        | M24 | 24.0      | 3.00      | 20                      | 265                       | 795             | 16                      | 210                       | 630             | 10                      | 135                       | 405             |
|                                                                                  |                                        | M27 | 27.0      | 3.00      | 20                      | 235                       | 705             | 16                      | 190                       | 570             | 10                      | 120                       | 360             |
|                                                                                  |                                        | M30 | 30.0      | 3.50      | 20                      | 210                       | 735             | 16                      | 170                       | 595             | 10                      | 105                       | 368             |
|                                                                                  |                                        |     |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|                                                                                  | Aciers<br>850 - 1100 N/mm <sup>2</sup> | M33 | 33.0      | 3.50      | 20                      | 195                       | 683             | 16                      | 155                       | 543             | 10                      | 95                        | 333             |
|                                                                                  |                                        | M36 | 36.0      | 4.00      | 20                      | 175                       | 700             | 16                      | 140                       | 560             | 10                      | 90                        | 360             |
|                                                                                  |                                        | M39 | 39.0      | 4.00      | 20                      | 165                       | 660             | 16                      | 130                       | 520             | 10                      | 80                        | 320             |
|                                                                                  |                                        | M42 | 42.0      | 4.50      | 20                      | 150                       | 675             | 16                      | 120                       | 540             | 10                      | 75                        | 338             |
|                                                                                  |                                        |     |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |

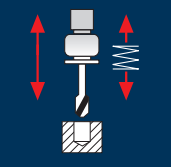
850-1100



M

850-1100

151

| Application                                                                      | Matières                               | M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>$1.0 \times d$ | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>$1.5 \times d$ | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>$2.0 \times d$ | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|----------------------------------------------------------------------------------|----------------------------------------|-----|-----------|-----------|-------------------------|---------------------------|-----------------|-------------------------|---------------------------|-----------------|-------------------------|---------------------------|-----------------|
|  | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M 4 | 4.0       | 0.70      | 32                      | 2545                      | 1782            | 28                      | 2230                      | 1561            | 22                      | 1750                      | 1225            |
|                                                                                  |                                        | M 5 | 5.0       | 0.80      | 32                      | 2035                      | 1628            | 28                      | 1785                      | 1428            | 22                      | 1400                      | 1120            |
|                                                                                  |                                        | M 6 | 6.0       | 1.00      | 32                      | 1700                      | 1700            | 28                      | 1485                      | 1485            | 22                      | 1165                      | 1165            |
|                                                                                  |                                        | M 8 | 8.0       | 1.25      | 32                      | 1275                      | 1594            | 28                      | 1115                      | 1394            | 22                      | 875                       | 1094            |
|                                                                                  |                                        | M10 | 10.0      | 1.50      | 32                      | 1020                      | 1530            | 28                      | 890                       | 1335            | 22                      | 700                       | 1050            |
|                                                                                  |                                        | M12 | 12.0      | 1.75      | 32                      | 850                       | 1488            | 28                      | 745                       | 1304            | 22                      | 585                       | 1024            |
|                                                                                  |                                        | M14 | 14.0      | 2.00      | 32                      | 730                       | 1460            | 28                      | 635                       | 1270            | 22                      | 500                       | 1000            |
|                                                                                  |                                        | M16 | 16.0      | 2.00      | 32                      | 635                       | 1270            | 28                      | 555                       | 1110            | 22                      | 440                       | 880             |
|                                                                                  |                                        | M18 | 18.0      | 2.50      | 32                      | 565                       | 1413            | 28                      | 495                       | 1238            | 22                      | 390                       | 975             |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M20 | 20.0      | 2.50      | 32                      | 510                       | 1275            | 28                      | 445                       | 1113            | 22                      | 350                       | 875             |
|                                                                                  |                                        | M22 | 22.0      | 2.50      | 32                      | 465                       | 1163            | 28                      | 405                       | 1013            | 22                      | 320                       | 800             |
|                                                                                  |                                        | M24 | 24.0      | 3.00      | 32                      | 425                       | 1275            | 28                      | 370                       | 1110            | 22                      | 290                       | 870             |
|                                                                                  |                                        |     |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|                                                                                  |                                        |     |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|                                                                                  | Aciers<br>850 - 1100 N/mm <sup>2</sup> | M 4 | 4.0       | 0.70      | 20                      | 1590                      | 1113            | 16                      | 1275                      | 893             | 10                      | 795                       | 557             |
|                                                                                  |                                        | M 5 | 5.0       | 0.80      | 20                      | 1275                      | 1020            | 16                      | 1020                      | 816             | 10                      | 635                       | 508             |
|                                                                                  |                                        | M 6 | 6.0       | 1.00      | 20                      | 1060                      | 1060            | 16                      | 850                       | 850             | 10                      | 530                       | 530             |
|                                                                                  |                                        | M 8 | 8.0       | 1.25      | 20                      | 795                       | 994             | 16                      | 635                       | 794             | 10                      | 400                       | 500             |
|                                                                                  |                                        | M10 | 10.0      | 1.50      | 20                      | 635                       | 953             | 16                      | 510                       | 765             | 10                      | 320                       | 480             |
|                                                                                  |                                        | M12 | 12.0      | 1.75      | 20                      | 530                       | 928             | 16                      | 425                       | 744             | 10                      | 265                       | 464             |
|                                                                                  |                                        | M14 | 14.0      | 2.00      | 20                      | 455                       | 910             | 16                      | 365                       | 730             | 10                      | 225                       | 450             |
|                                                                                  |                                        | M16 | 16.0      | 2.00      | 20                      | 400                       | 800             | 16                      | 320                       | 640             | 10                      | 200                       | 400             |
|                                                                                  |                                        | M18 | 18.0      | 2.50      | 20                      | 355                       | 888             | 16                      | 285                       | 713             | 10                      | 175                       | 438             |
|                                                                                  | Aciers<br>850 - 1100 N/mm <sup>2</sup> | M20 | 20.0      | 2.50      | 20                      | 320                       | 800             | 16                      | 255                       | 638             | 10                      | 160                       | 400             |
|                                                                                  |                                        | M22 | 22.0      | 2.50      | 20                      | 290                       | 725             | 16                      | 230                       | 575             | 10                      | 145                       | 363             |
|                                                                                  |                                        | M24 | 24.0      | 3.00      | 20                      | 265                       | 795             | 16                      | 210                       | 630             | 10                      | 135                       | 405             |
|                                                                                  |                                        |     |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|                                                                                  |                                        |     |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |

# Tarauds x-tap

Incool

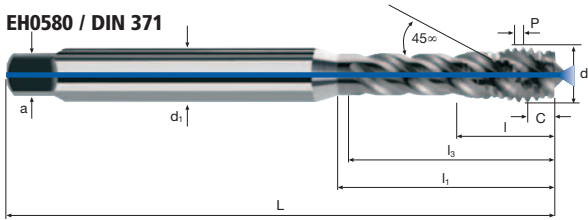


M

ISO 2  
(6H)

HSS  
PM/F

Form C



EH0581 / DIN 376



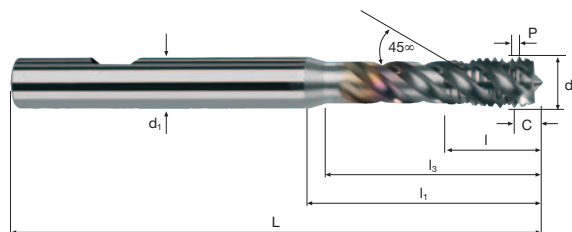
|             |                |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|

| Exemple: N° cde |     |      |     |    |    |    |      |     |   |      | TiCN   |
|-----------------|-----|------|-----|----|----|----|------|-----|---|------|--------|
| N° d'article    |     |      |     |    |    |    |      |     |   |      | EH0580 |
| Code-ø          |     |      |     |    |    |    |      |     |   |      |        |
| ø<br>Code       | d   | P    | L   | l  | l1 | l3 | d1   | a   |   |      |        |
| .058            | M 4 | 0.70 | 63  | 7  | —  | 19 | 4.5  | 3.4 | 3 | 3.30 | ●      |
| .084            | M 5 | 0.80 | 70  | 8  | —  | 23 | 6.0  | 4.9 | 3 | 4.20 | ●      |
| .088            | M 6 | 1.00 | 80  | 10 | —  | 28 | 6.0  | 4.9 | 3 | 5.00 | ●      |
| .160            | M 8 | 1.25 | 90  | 13 | 35 | 33 | 8.0  | 6.2 | 3 | 6.80 | ●      |
| .174            | M10 | 1.50 | 100 | 15 | 39 | 37 | 10.0 | 8.0 | 4 | 8.50 | ●      |
|                 |     |      |     |    |    |    |      |     |   |      |        |
|                 |     |      |     |    |    |    |      |     |   |      |        |
|                 |     |      |     |    |    |    |      |     |   |      |        |
|                 |     |      |     |    |    |    |      |     |   |      |        |

| Exemple: N° cde |     |      |     |    |    |    |      |      |   |       | TiCN   |
|-----------------|-----|------|-----|----|----|----|------|------|---|-------|--------|
| N° d'article    |     |      |     |    |    |    |      |      |   |       | EH0581 |
| Code-ø          |     |      |     |    |    |    |      |      |   |       |        |
| ø<br>Code       | d   | P    | L   | l  | l1 | l3 | d1   | a    |   |       |        |
| .240            | M12 | 1.75 | 110 | 18 | 50 | 48 | 9.0  | 7.0  | 4 | 10.20 | ●      |
| .244            | M14 | 2.00 | 110 | 20 | 58 | 56 | 11.0 | 9.0  | 4 | 12.00 | ●      |
| .246            | M16 | 2.00 | 110 | 20 | 58 | 56 | 12.0 | 9.0  | 4 | 14.00 | ●      |
| .312            | M18 | 2.50 | 125 | 25 | 65 | 63 | 14.0 | 11.0 | 4 | 15.50 | ●      |
| .314            | M20 | 2.50 | 140 | 25 | 72 | 70 | 16.0 | 12.0 | 4 | 17.50 | ●      |
| .316            | M22 | 2.50 | 140 | 25 | 72 | 70 | 18.0 | 14.5 | 5 | 19.50 | ●      |
| .320            | M24 | 3.00 | 160 | 30 | 74 | 72 | 18.0 | 14.5 | 5 | 21.00 | ●      |
|                 |     |      |     |    |    |    |      |      |   |       |        |
|                 |     |      |     |    |    |    |      |      |   |       |        |

| Application                                                                       | Matières                               | M    | ø<br>[mm] | P<br>[mm] | V <sub>c</sub><br>1.0 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | V <sub>c</sub><br>1.5 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | V <sub>c</sub><br>2.0 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] |
|-----------------------------------------------------------------------------------|----------------------------------------|------|-----------|-----------|--------------------------------------|---------------------------|--------------------------------------|---------------------------|--------------------------------------|---------------------------|
|  | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M 3  | 3.0       | 0.50      | 34                                   | 3610                      | 30                                   | 3185                      | 24                                   | 2545                      |
|                                                                                   |                                        | M 4  | 4.0       | 0.70      | 34                                   | 2705                      | 30                                   | 2385                      | 24                                   | 1910                      |
|                                                                                   |                                        | M 5  | 5.0       | 0.80      | 34                                   | 2165                      | 30                                   | 1910                      | 24                                   | 1530                      |
|                                                                                   |                                        | M 6  | 6.0       | 1.00      | 34                                   | 1805                      | 30                                   | 1590                      | 24                                   | 1275                      |
|                                                                                   |                                        | M 8  | 8.0       | 1.25      | 34                                   | 1355                      | 30                                   | 1195                      | 24                                   | 955                       |
|                                                                                   |                                        | M10  | 10.0      | 1.50      | 34                                   | 1080                      | 30                                   | 955                       | 24                                   | 765                       |
|                                                                                   |                                        | M12  | 12.0      | 1.75      | 34                                   | 900                       | 30                                   | 795                       | 24                                   | 635                       |
|                                                                                   |                                        | M14  | 14.0      | 2.00      | 34                                   | 775                       | 30                                   | 680                       | 24                                   | 545                       |
|                                                                                   |                                        | M16  | 16.0      | 2.00      | 34                                   | 675                       | 30                                   | 595                       | 24                                   | 475                       |
|                                                                                   |                                        | M18  | 18.0      | 2.50      | 34                                   | 600                       | 30                                   | 530                       | 24                                   | 425                       |
|                                                                                   |                                        | M20  | 20.0      | 2.50      | 34                                   | 540                       | 30                                   | 475                       | 24                                   | 380                       |
|                                                                                   |                                        | M22  | 22.0      | 2.50      | 34                                   | 490                       | 30                                   | 435                       | 24                                   | 345                       |
|                                                                                   |                                        | M24  | 24.0      | 3.00      | 34                                   | 450                       | 30                                   | 400                       | 24                                   | 320                       |
|                                                                                   |                                        |      |           |           |                                      |                           |                                      |                           |                                      |                           |
|                                                                                   | Aciers<br>850 - 1100 N/mm <sup>2</sup> | M 3  | 3.0       | 0.50      | 22                                   | 2335                      | 18                                   | 1910                      | 12                                   | 1275                      |
| M 4                                                                               |                                        | 4.0  | 0.70      | 22        | 1750                                 | 18                        | 1430                                 | 12                        | 955                                  |                           |
| M 5                                                                               |                                        | 5.0  | 0.80      | 22        | 1400                                 | 18                        | 1145                                 | 12                        | 765                                  |                           |
| M 6                                                                               |                                        | 6.0  | 1.00      | 22        | 1165                                 | 18                        | 955                                  | 12                        | 635                                  |                           |
| M 8                                                                               |                                        | 8.0  | 1.25      | 22        | 875                                  | 18                        | 715                                  | 12                        | 475                                  |                           |
| M10                                                                               |                                        | 10.0 | 1.50      | 22        | 700                                  | 18                        | 575                                  | 12                        | 380                                  |                           |
| M12                                                                               |                                        | 12.0 | 1.75      | 22        | 585                                  | 18                        | 475                                  | 12                        | 320                                  |                           |
| M14                                                                               |                                        | 14.0 | 2.00      | 22        | 500                                  | 18                        | 410                                  | 12                        | 275                                  |                           |
| M16                                                                               |                                        | 16.0 | 2.00      | 22        | 440                                  | 18                        | 360                                  | 12                        | 240                                  |                           |
|                                                                                   | M18                                    | 18.0 | 2.50      | 22        | 390                                  | 18                        | 320                                  | 12                        | 210                                  |                           |
|                                                                                   | M20                                    | 20.0 | 2.50      | 22        | 350                                  | 18                        | 285                                  | 12                        | 190                                  |                           |
|                                                                                   | M22                                    | 22.0 | 2.50      | 22        | 320                                  | 18                        | 260                                  | 12                        | 175                                  |                           |
|                                                                                   | M24                                    | 24.0 | 3.00      | 22        | 290                                  | 18                        | 240                                  | 12                        | 160                                  |                           |
|                                                                                   |                                        |      |           |           |                                      |                           |                                      |                           |                                      |                           |
|                                                                                   |                                        |      |           |           |                                      |                           |                                      |                           |                                      |                           |
|                                                                                   |                                        |      |           |           |                                      |                           |                                      |                           |                                      |                           |
|                                                                                   |                                        |      |           |           |                                      |                           |                                      |                           |                                      |                           |
|                                                                                   |                                        |      |           |           |                                      |                           |                                      |                           |                                      |                           |
|                                                                                   |                                        |      |           |           |                                      |                           |                                      |                           |                                      |                           |

**Form C**

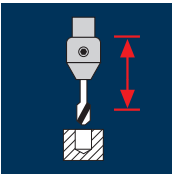


M

850-1100

155

## Application



## Matières

**Aciers**  
500 - 850 N/mm<sup>2</sup>

Aciers  
500 - 850 N/mm<sup>2</sup>

Aciers  
850 - 1100 N/mm<sup>2</sup>

Aciers  
850 - 1100 N/mm<sup>2</sup>

[illegible]



## Tarauds x-tap-R

Incool

11

M

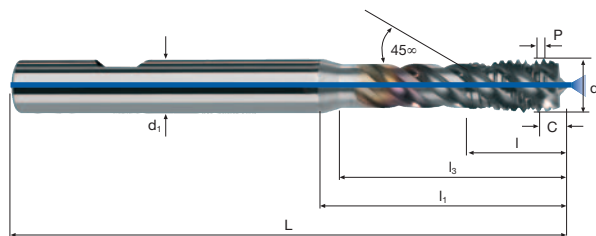
**ISO 2  
(6H)**



**HSS  
PM/F**



Form C

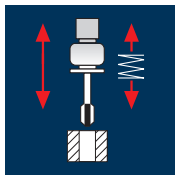


M

**Rm**  
 $< 850$

**Rm**  
850-1100

## Application



## Matières

Aciers  
1100 - 1300 N/mm<sup>2</sup>



Aciers  
1100 - 1300 N/mm<sup>2</sup>



Aciers  
1300 - 1500 N/mm<sup>2</sup>



Aciers  
1300 - 1500 N/mm<sup>2</sup>



| M     | ø    | P    | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  |
|-------|------|------|----------------|----------------------|--------|----------------|----------------------|--------|----------------|----------------------|--------|
|       | [mm] | [mm] | $1.0 \times d$ | [min <sup>-1</sup> ] | [100%] | $1.5 \times d$ | [min <sup>-1</sup> ] | [100%] | $2.0 \times d$ | [min <sup>-1</sup> ] | [100%] |
| M 2   | 2.0  | 0.40 | 10             | 1590                 | 636    | 8              | 1275                 | 510    | 5              | 795                  | 318    |
| M 2.5 | 2.5  | 0.45 | 10             | 1275                 | 574    | 8              | 1020                 | 459    | 5              | 635                  | 286    |
| M 3   | 3.0  | 0.50 | 10             | 1060                 | 530    | 8              | 850                  | 425    | 5              | 530                  | 265    |
| M 4   | 4.0  | 0.70 | 10             | 795                  | 557    | 8              | 635                  | 445    | 5              | 400                  | 280    |
| M 5   | 5.0  | 0.80 | 10             | 635                  | 508    | 8              | 510                  | 408    | 5              | 320                  | 256    |
| M 6   | 6.0  | 1.00 | 10             | 530                  | 530    | 8              | 425                  | 425    | 5              | 265                  | 265    |
| M 8   | 8.0  | 1.25 | 10             | 400                  | 500    | 8              | 320                  | 400    | 5              | 200                  | 250    |
| M10   | 10.0 | 1.50 | 10             | 320                  | 480    | 8              | 255                  | 383    | 5              | 160                  | 240    |
| M12   | 12.0 | 1.75 | 10             | 265                  | 464    | 8              | 210                  | 368    | 5              | 135                  | 236    |
| M14   | 14.0 | 2.00 | 10             | 225                  | 450    | 8              | 180                  | 360    | 5              | 115                  | 230    |
| M16   | 16.0 | 2.00 | 10             | 200                  | 400    | 8              | 160                  | 320    | 5              | 100                  | 200    |
| M18   | 18.0 | 2.50 | 10             | 175                  | 438    | 8              | 140                  | 350    | 5              | 90                   | 225    |
| M20   | 20.0 | 2.50 | 10             | 160                  | 400    | 8              | 125                  | 313    | 5              | 80                   | 200    |
| M22   | 22.0 | 2.50 | 10             | 145                  | 363    | 8              | 115                  | 288    | 5              | 70                   | 175    |
| M24   | 24.0 | 3.00 | 10             | 135                  | 405    | 8              | 105                  | 315    | 5              | 65                   | 195    |
|       |      |      |                |                      |        |                |                      |        |                |                      |        |
|       |      |      |                |                      |        |                |                      |        |                |                      |        |
| M 2   | 2.0  | 0.40 | 6              | 955                  | 382    | 4              | 635                  | 254    | 3              | 475                  | 190    |
| M 2.5 | 2.5  | 0.45 | 6              | 765                  | 344    | 4              | 510                  | 230    | 3              | 380                  | 171    |
| M 3   | 3.0  | 0.50 | 6              | 635                  | 318    | 4              | 425                  | 213    | 3              | 320                  | 160    |
| M 4   | 4.0  | 0.70 | 6              | 475                  | 333    | 4              | 320                  | 224    | 3              | 240                  | 168    |
| M 5   | 5.0  | 0.80 | 6              | 380                  | 304    | 4              | 255                  | 204    | 3              | 190                  | 152    |
| M 6   | 6.0  | 1.00 | 6              | 320                  | 320    | 4              | 210                  | 210    | 3              | 160                  | 160    |
| M 8   | 8.0  | 1.25 | 6              | 240                  | 300    | 4              | 160                  | 200    | 3              | 120                  | 150    |
| M10   | 10.0 | 1.50 | 6              | 190                  | 285    | 4              | 125                  | 188    | 3              | 95                   | 143    |
| M12   | 12.0 | 1.75 | 6              | 160                  | 280    | 4              | 105                  | 184    | 3              | 80                   | 140    |
| M14   | 14.0 | 2.00 | 6              | 135                  | 270    | 4              | 90                   | 180    | 3              | 70                   | 140    |
| M16   | 16.0 | 2.00 | 6              | 120                  | 240    | 4              | 80                   | 160    | 3              | 60                   | 120    |
| M18   | 18.0 | 2.50 | 6              | 105                  | 263    | 4              | 70                   | 175    | 3              | 55                   | 138    |
| M20   | 20.0 | 2.50 | 6              | 95                   | 238    | 4              | 65                   | 163    | 3              | 50                   | 125    |
| M22   | 22.0 | 2.50 | 6              | 85                   | 213    | 4              | 60                   | 150    | 3              | 45                   | 113    |
| M24   | 24.0 | 3.00 | 6              | 80                   | 240    | 4              | 55                   | 165    | 3              | 40                   | 120    |
|       |      |      |                |                      |        |                |                      |        |                |                      |        |
|       |      |      |                |                      |        |                |                      |        |                |                      |        |
|       |      |      |                |                      |        |                |                      |        |                |                      |        |

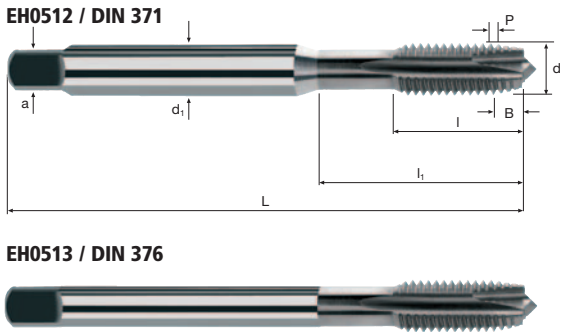
M

ISO 2  
(6H)

HSS  
PM/F

DIN  
371/376

Form B

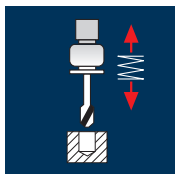


|  |  |                 |                 |  |  |  |  |  |  |  |
|--|--|-----------------|-----------------|--|--|--|--|--|--|--|
|  |  | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  |  |  |  |  |
|--|--|-----------------|-----------------|--|--|--|--|--|--|--|

| Exemple: N° cde |       |      |     |    |      |      |     |   |        | TiCN   |
|-----------------|-------|------|-----|----|------|------|-----|---|--------|--------|
| N° d'article    |       |      |     |    |      |      |     |   |        | EH0512 |
| Code-ø          |       |      |     |    |      |      |     |   |        |        |
| ø<br>Code       | d     | P    | L   | l  | l1   | d1   | a   |   |        |        |
| .034            | M 2   | 0.40 | 45  | 8  | —    | 2.8  | 2.1 | 2 | 1.70 * | ●      |
| .040            | M 2.5 | 0.45 | 50  | 9  | —    | 2.8  | 2.1 | 2 | 2.10   | ●      |
| .044            | M 3   | 0.50 | 56  | 12 | 18.0 | 3.5  | 2.7 | 3 | 2.60 * | ●      |
| .058            | M 4   | 0.70 | 63  | 13 | 21.0 | 4.5  | 3.4 | 3 | 3.40   | ●      |
| .084            | M 5   | 0.80 | 70  | 15 | 25.0 | 6.0  | 4.9 | 3 | 4.30   | ●      |
| .088            | M 6   | 1.00 | 80  | 17 | 30.0 | 6.0  | 4.9 | 3 | 5.10   | ●      |
| .160            | M 8   | 1.25 | 90  | 20 | 35.0 | 8.0  | 6.2 | 3 | 6.90   | ●      |
| .174            | M10   | 1.50 | 100 | 22 | 39.0 | 10.0 | 8.0 | 3 | 8.60   | ●      |

| Exemple: N° cde                      |     |      |     |    |      |      |      |   |       | TiCN   |
|--------------------------------------|-----|------|-----|----|------|------|------|---|-------|--------|
| N° d'article                         |     |      |     |    |      |      |      |   |       | EH0513 |
| Code-ø                               |     |      |     |    |      |      |      |   |       |        |
| ø<br>Code                            | d   | P    | L   | l  | l1   | d1   | a    |   |       |        |
| .240                                 | M12 | 1.75 | 110 | 24 | 40.0 | 9.0  | 7.0  | 3 | 10.40 | ●      |
| .244                                 | M14 | 2.00 | 110 | 26 | 40.0 | 11.0 | 9.0  | 3 | 12.20 | ●      |
| .246                                 | M16 | 2.00 | 110 | 27 | 40.0 | 12.0 | 9.0  | 3 | 14.20 | ●      |
| .312                                 | M18 | 2.50 | 125 | 30 | 45.0 | 14.0 | 11.0 | 4 | 15.70 | ●      |
| .314                                 | M20 | 2.50 | 140 | 32 | 50.0 | 16.0 | 12.0 | 4 | 17.70 | ●      |
| .316                                 | M22 | 2.50 | 140 | 32 | 50.0 | 18.0 | 14.5 | 4 | 19.70 | ●      |
| .320                                 | M24 | 3.00 | 160 | 34 | 60.0 | 18.0 | 14.5 | 4 | 21.20 | ●      |
| * La dimension donnée est hors norme |     |      |     |    |      |      |      |   |       |        |

## Application



## Matières

Aciers  
1100 - 1300 N/mm<sup>2</sup>



Aciers  
1100 - 1300 N/mm<sup>2</sup>



Aciers  
1300 - 1500 N/mm<sup>2</sup>



Aciers  
1300 - 1500 N/mm<sup>2</sup>



| M   | ø    | P    | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  |  |
|-----|------|------|---------|----------------------|--------|---------|----------------------|--------|--|
|     | [mm] | [mm] | 1.0 x d | [min <sup>-1</sup> ] | [100%] | 1.5 x d | [min <sup>-1</sup> ] | [100%] |  |
| M 3 | 3.0  | 0.50 | 6       | 635                  | 318    | 5       | 530                  | 265    |  |
| M 4 | 4.0  | 0.70 | 6       | 475                  | 333    | 5       | 400                  | 280    |  |
| M 5 | 5.0  | 0.80 | 6       | 380                  | 304    | 5       | 320                  | 256    |  |
| M 6 | 6.0  | 1.00 | 6       | 320                  | 320    | 5       | 265                  | 265    |  |
| M 8 | 8.0  | 1.25 | 6       | 240                  | 300    | 5       | 200                  | 250    |  |
| M10 | 10.0 | 1.50 | 6       | 190                  | 285    | 5       | 160                  | 240    |  |
| M12 | 12.0 | 1.75 | 6       | 160                  | 280    | 5       | 135                  | 236    |  |
| M14 | 14.0 | 2.00 | 6       | 135                  | 270    | 5       | 115                  | 230    |  |
| M16 | 16.0 | 2.00 | 6       | 120                  | 240    | 5       | 100                  | 200    |  |
| M18 | 18.0 | 2.50 | 6       | 105                  | 263    | 5       | 90                   | 225    |  |
| M20 | 20.0 | 2.50 | 6       | 95                   | 238    | 5       | 80                   | 200    |  |
| M22 | 22.0 | 2.50 | 6       | 85                   | 213    | 5       | 70                   | 175    |  |
| M24 | 24.0 | 3.00 | 6       | 80                   | 240    | 5       | 65                   | 195    |  |
|     |      |      |         |                      |        |         |                      |        |  |
|     |      |      |         |                      |        |         |                      |        |  |
|     |      |      |         |                      |        |         |                      |        |  |
|     |      |      |         |                      |        |         |                      |        |  |
|     |      |      |         |                      |        |         |                      |        |  |
| M 3 | 3.0  | 0.50 | 5       | 530                  | 265    | 4       | 425                  | 213    |  |
| M 4 | 4.0  | 0.70 | 5       | 400                  | 280    | 4       | 320                  | 224    |  |
| M 5 | 5.0  | 0.80 | 5       | 320                  | 256    | 4       | 255                  | 204    |  |
| M 6 | 6.0  | 1.00 | 5       | 265                  | 265    | 4       | 210                  | 210    |  |
| M 8 | 8.0  | 1.25 | 5       | 200                  | 250    | 4       | 160                  | 200    |  |
| M10 | 10.0 | 1.50 | 5       | 160                  | 240    | 4       | 125                  | 188    |  |
| M12 | 12.0 | 1.75 | 5       | 135                  | 236    | 4       | 105                  | 184    |  |
| M14 | 14.0 | 2.00 | 5       | 115                  | 230    | 4       | 90                   | 180    |  |
| M16 | 16.0 | 2.00 | 5       | 100                  | 200    | 4       | 80                   | 160    |  |
| M18 | 18.0 | 2.50 | 5       | 90                   | 225    | 4       | 70                   | 175    |  |
| M20 | 20.0 | 2.50 | 5       | 80                   | 200    | 4       | 65                   | 163    |  |
| M22 | 22.0 | 2.50 | 5       | 70                   | 175    | 4       | 60                   | 150    |  |
| M24 | 24.0 | 3.00 | 5       | 65                   | 195    | 4       | 55                   | 165    |  |
|     |      |      |         |                      |        |         |                      |        |  |
|     |      |      |         |                      |        |         |                      |        |  |
|     |      |      |         |                      |        |         |                      |        |  |
|     |      |      |         |                      |        |         |                      |        |  |
|     |      |      |         |                      |        |         |                      |        |  |

Tarauds h-tap

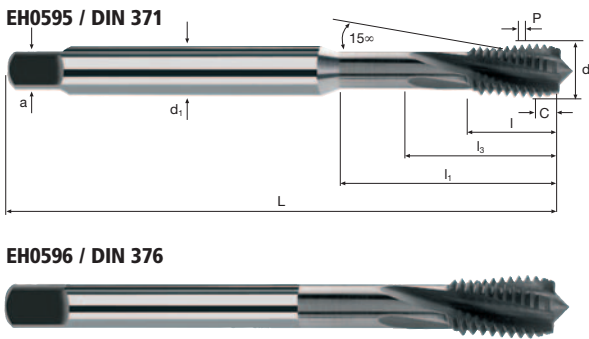


M

ISO 2  
(6H)

HSS  
PM/F

Form C



|  |  |                 |                 |  |  |  |  |  |  |  |
|--|--|-----------------|-----------------|--|--|--|--|--|--|--|
|  |  | Rm<br>1100-1300 | Rm<br>1300-1500 |  |  |  |  |  |  |  |
|--|--|-----------------|-----------------|--|--|--|--|--|--|--|

| Exemple: N° cde |     |      |     |    |    |    |      |     |   |        | TiCN   |
|-----------------|-----|------|-----|----|----|----|------|-----|---|--------|--------|
| N° d'article    |     |      |     |    |    |    |      |     |   |        | EH0595 |
| Code-ø          |     |      |     |    |    |    |      |     |   |        |        |
| Ø<br>Code       | d   | P    | L   | l  | l1 | l2 | d1   | a   |   |        |        |
| .044            | M 3 | 0.50 | 56  | 5  | 18 | 16 | 3.5  | 2.7 | 3 | 2.60 * | ●      |
| .058            | M 4 | 0.70 | 63  | 7  | 21 | 19 | 4.5  | 3.4 | 3 | 3.40   | ●      |
| .084            | M 5 | 0.80 | 70  | 8  | 25 | 23 | 6.0  | 4.9 | 3 | 4.30   | ●      |
| .088            | M 6 | 1.00 | 80  | 10 | 30 | 28 | 6.0  | 4.9 | 3 | 5.10   | ●      |
| .160            | M 8 | 1.25 | 90  | 13 | 35 | 33 | 8.0  | 6.2 | 3 | 6.90   | ●      |
| .174            | M10 | 1.50 | 100 | 15 | 39 | 37 | 10.0 | 8.0 | 4 | 8.60   | ●      |
|                 |     |      |     |    |    |    |      |     |   |        |        |
|                 |     |      |     |    |    |    |      |     |   |        |        |
|                 |     |      |     |    |    |    |      |     |   |        |        |

| Exemple: N° cde                      |     |      |     |    |    |    |      |      |   |       | TiCN   |
|--------------------------------------|-----|------|-----|----|----|----|------|------|---|-------|--------|
| N° d'article                         |     |      |     |    |    |    |      |      |   |       | EH0596 |
| Code-ø                               |     |      |     |    |    |    |      |      |   |       |        |
| Ø<br>Code                            | d   | P    | L   | l  | l1 | l2 | d1   | a    |   |       |        |
| .240                                 | M12 | 1.75 | 110 | 18 | 50 | 48 | 9.0  | 7.0  | 4 | 10.40 | ●      |
| .244                                 | M14 | 2.00 | 110 | 20 | 58 | 56 | 11.0 | 9.0  | 4 | 12.20 | ●      |
| .246                                 | M16 | 2.00 | 110 | 20 | 58 | 56 | 12.0 | 9.0  | 4 | 14.20 | ●      |
| .312                                 | M18 | 2.50 | 125 | 25 | 65 | 63 | 14.0 | 11.0 | 4 | 15.70 | ●      |
| .314                                 | M20 | 2.50 | 140 | 25 | 72 | 70 | 16.0 | 12.0 | 4 | 17.70 | ●      |
| .316                                 | M22 | 2.50 | 140 | 25 | 72 | 70 | 18.0 | 14.5 | 4 | 19.70 | ●      |
| .320                                 | M24 | 3.00 | 160 | 30 | 74 | 72 | 18.0 | 14.5 | 5 | 21.20 | ●      |
|                                      |     |      |     |    |    |    |      |      |   |       |        |
| * La dimension donnée est hors norme |     |      |     |    |    |    |      |      |   |       |        |

| Application | Matières                              |      |      |      |                |                      |        |                |                      |        |
|-------------|---------------------------------------|------|------|------|----------------|----------------------|--------|----------------|----------------------|--------|
|             |                                       | M    | ø    | P    | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  |
|             |                                       | [mm] | [mm] |      | $1.5 \times d$ | [min <sup>-1</sup> ] | [100%] | $2.0 \times d$ | [min <sup>-1</sup> ] | [100%] |
|             | Aciers à outil trempés<br>48 - 52 HRC | M 4  | 4.0  | 0.70 | 8              | 635                  | 445    | 6              | 475                  | 333    |
|             |                                       | M 5  | 5.0  | 0.80 | 8              | 510                  | 408    | 6              | 380                  | 304    |
|             |                                       | M 6  | 6.0  | 1.00 | 8              | 425                  | 425    | 6              | 320                  | 320    |
|             |                                       | M 8  | 8.0  | 1.25 | 8              | 320                  | 400    | 6              | 240                  | 300    |
|             |                                       | M10  | 10.0 | 1.50 | 8              | 255                  | 383    | 6              | 190                  | 285    |
|             |                                       | M12  | 12.0 | 1.75 | 8              | 210                  | 368    | 6              | 160                  | 280    |
|             | Aciers à outil trempés<br>52 - 56 HRC | M14  | 14.0 | 2.00 | 8              | 180                  | 360    | 6              | 135                  | 270    |
|             |                                       | M16  | 16.0 | 2.00 | 8              | 160                  | 320    | 6              | 120                  | 240    |
|             |                                       | M 4  | 4.0  | 0.70 | 6              | 475                  | 333    | 4              | 320                  | 224    |
|             |                                       | M 5  | 5.0  | 0.80 | 6              | 380                  | 304    | 4              | 255                  | 204    |
|             |                                       | M 6  | 6.0  | 1.00 | 6              | 320                  | 320    | 4              | 210                  | 210    |
|             |                                       | M 8  | 8.0  | 1.25 | 6              | 240                  | 300    | 4              | 160                  | 200    |
|             | Aciers à outil trempés<br>56 - 60 HRC | M10  | 10.0 | 1.50 | 6              | 190                  | 285    | 4              | 125                  | 188    |
|             |                                       | M12  | 12.0 | 1.75 | 6              | 160                  | 280    | 4              | 105                  | 184    |
|             |                                       | M14  | 14.0 | 2.00 | 6              | 135                  | 270    | 4              | 90                   | 180    |
|             |                                       | M16  | 16.0 | 2.00 | 6              | 120                  | 240    | 4              | 80                   | 160    |
|             |                                       | M 4  | 4.0  | 0.70 | 4              | 320                  | 224    | 2              | 160                  | 112    |
|             |                                       | M 5  | 5.0  | 0.80 | 4              | 255                  | 204    | 2              | 125                  | 100    |
|             | Aciers à outil trempés<br>> 60 HRC    | M 6  | 6.0  | 1.00 | 4              | 210                  | 210    | 2              | 105                  | 105    |
|             |                                       | M 8  | 8.0  | 1.25 | 4              | 160                  | 200    | 2              | 80                   | 100    |
|             |                                       | M10  | 10.0 | 1.50 | 4              | 125                  | 188    | 2              | 65                   | 98     |
|             |                                       | M12  | 12.0 | 1.75 | 4              | 105                  | 184    | 2              | 55                   | 96     |
|             |                                       | M14  | 14.0 | 2.00 | 4              | 90                   | 180    | 2              | 45                   | 90     |
|             |                                       | M16  | 16.0 | 2.00 | 4              | 80                   | 160    | 2              | 40                   | 80     |

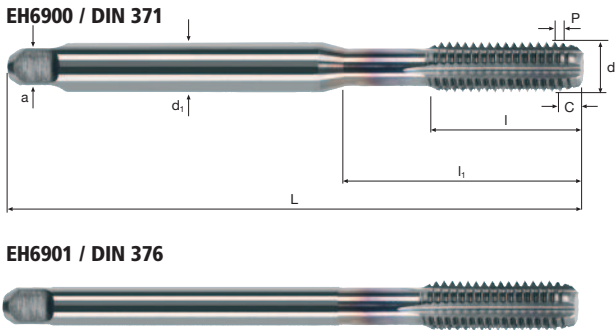
| Application | Matières                              |      |      |      |                |                      |        |                |                      |        |
|-------------|---------------------------------------|------|------|------|----------------|----------------------|--------|----------------|----------------------|--------|
|             |                                       | M    | ø    | P    | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  |
|             |                                       | [mm] | [mm] |      | $1.5 \times d$ | [min <sup>-1</sup> ] | [100%] | $2.0 \times d$ | [min <sup>-1</sup> ] | [100%] |
|             | Aciers à outil trempés<br>48 - 52 HRC | M 4  | 4.0  | 0.70 | 8              | 635                  | 445    | 6              | 475                  | 333    |
|             |                                       | M 5  | 5.0  | 0.80 | 8              | 510                  | 408    | 6              | 380                  | 304    |
|             |                                       | M 6  | 6.0  | 1.00 | 8              | 425                  | 425    | 6              | 320                  | 320    |
|             |                                       | M 8  | 8.0  | 1.25 | 8              | 320                  | 400    | 6              | 240                  | 300    |
|             |                                       | M10  | 10.0 | 1.50 | 8              | 255                  | 383    | 6              | 190                  | 285    |
|             |                                       | M12  | 12.0 | 1.75 | 8              | 210                  | 368    | 6              | 160                  | 280    |
|             | Aciers à outil trempés<br>52 - 56 HRC | M14  | 14.0 | 2.00 | 8              | 180                  | 360    | 6              | 135                  | 270    |
|             |                                       | M16  | 16.0 | 2.00 | 8              | 160                  | 320    | 6              | 120                  | 240    |
|             |                                       | M 4  | 4.0  | 0.70 | 6              | 475                  | 333    | 4              | 320                  | 224    |
|             |                                       | M 5  | 5.0  | 0.80 | 6              | 380                  | 304    | 4              | 255                  | 204    |
|             |                                       | M 6  | 6.0  | 1.00 | 6              | 320                  | 320    | 4              | 210                  | 210    |
|             |                                       | M 8  | 8.0  | 1.25 | 6              | 240                  | 300    | 4              | 160                  | 200    |
|             | Aciers à outil trempés<br>56 - 60 HRC | M10  | 10.0 | 1.50 | 6              | 190                  | 285    | 4              | 125                  | 188    |
|             |                                       | M12  | 12.0 | 1.75 | 6              | 160                  | 280    | 4              | 105                  | 184    |
|             |                                       | M14  | 14.0 | 2.00 | 6              | 135                  | 270    | 4              | 90                   | 180    |
|             |                                       | M16  | 16.0 | 2.00 | 6              | 120                  | 240    | 4              | 80                   | 160    |
|             |                                       | M 4  | 4.0  | 0.70 | 4              | 320                  | 224    | 2              | 160                  | 112    |
|             |                                       | M 5  | 5.0  | 0.80 | 4              | 255                  | 204    | 2              | 125                  | 100    |
|             | Aciers à outil trempés<br>> 60 HRC    | M 6  | 6.0  | 1.00 | 4              | 210                  | 210    | 2              | 105                  | 105    |
|             |                                       | M 8  | 8.0  | 1.25 | 4              | 160                  | 200    | 2              | 80                   | 100    |
|             |                                       | M10  | 10.0 | 1.50 | 4              | 125                  | 188    | 2              | 65                   | 98     |
|             |                                       | M12  | 12.0 | 1.75 | 4              | 105                  | 184    | 2              | 55                   | 96     |
|             |                                       | M14  | 14.0 | 2.00 | 4              | 90                   | 180    | 2              | 45                   | 90     |
|             |                                       | M16  | 16.0 | 2.00 | 4              | 80                   | 160    | 2              | 40                   | 80     |



M

ISO 2  
(6H)

HM  
MG10



M

HRC  
48-56

HRC  
56-60

HRC  
> 60

| Exemple: N° cde |     |      |     |    |                |                |     |   |      | TiCN   |   |
|-----------------|-----|------|-----|----|----------------|----------------|-----|---|------|--------|---|
| N° d'article    |     |      |     |    |                |                |     |   |      | EH6900 |   |
| Code-ø          |     |      |     |    |                |                |     |   |      |        |   |
| Ø<br>Code       | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   |      |        |   |
| .058            | M 4 | 0.70 | 63  | 13 | 21             | 4.5            | 3.4 | 4 | 3.40 |        | ● |
| .084            | M 5 | 0.80 | 70  | 15 | 25             | 6.0            | 4.9 | 4 | 4.30 |        | ● |
| .088            | M 6 | 1.00 | 80  | 17 | 30             | 6.0            | 4.9 | 4 | 5.10 |        | ● |
| .160            | M 8 | 1.25 | 90  | 20 | 35             | 8.0            | 6.2 | 5 | 6.90 |        | ● |
| .174            | M10 | 1.50 | 100 | 22 | 39             | 10.0           | 8.0 | 5 | 8.60 |        | ● |
|                 |     |      |     |    |                |                |     |   |      |        |   |
|                 |     |      |     |    |                |                |     |   |      |        |   |
|                 |     |      |     |    |                |                |     |   |      |        |   |
|                 |     |      |     |    |                |                |     |   |      |        |   |

| Exemple: N° cde |     |      |     |    |                |                |     |   |       | TiCN   |   |
|-----------------|-----|------|-----|----|----------------|----------------|-----|---|-------|--------|---|
| N° d'article    |     |      |     |    |                |                |     |   |       | EH6901 |   |
| Code-ø          |     |      |     |    |                |                |     |   |       |        |   |
| Ø<br>Code       | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   |       |        |   |
| .240            | M12 | 1.75 | 110 | 24 | 40             | 9.0            | 7.0 | 5 | 10.40 |        | ● |
| .244            | M14 | 2.00 | 110 | 26 | 40             | 11.0           | 9.0 | 5 | 12.20 |        | ● |
| .246            | M16 | 2.00 | 110 | 27 | 40             | 12.0           | 9.0 | 5 | 14.20 |        | ● |
|                 |     |      |     |    |                |                |     |   |       |        |   |
|                 |     |      |     |    |                |                |     |   |       |        |   |
|                 |     |      |     |    |                |                |     |   |       |        |   |
|                 |     |      |     |    |                |                |     |   |       |        |   |
|                 |     |      |     |    |                |                |     |   |       |        |   |







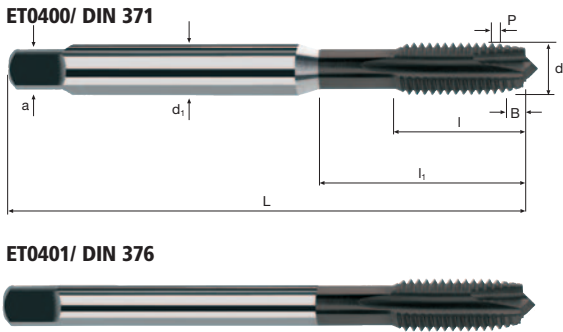
M

ISO 2  
(6H)

HSS  
PM/F

DIN  
371/376

Form B



Inox  
Stainless

| Exemple: N° cde |       |      |     |    |      |      |     |   |        | TRIBO  |
|-----------------|-------|------|-----|----|------|------|-----|---|--------|--------|
| N° d'article    |       |      |     |    |      |      |     |   |        | ET0400 |
| Code-ø          |       |      |     |    |      |      |     |   |        |        |
| Ø Code          | d     | P    | L   | l  | l1   | d1   | a   |   |        |        |
| .034            | M 2   | 0.40 | 45  | 8  | —    | 2.8  | 2.1 | 2 | 1.70 * | ●      |
| .040            | M 2.5 | 0.45 | 50  | 9  | —    | 2.8  | 2.1 | 2 | 2.10   | ●      |
| .044            | M 3   | 0.50 | 56  | 12 | 18.0 | 3.5  | 2.7 | 3 | 2.60 * | ●      |
| .058            | M 4   | 0.70 | 63  | 13 | 21.0 | 4.5  | 3.4 | 3 | 3.40   | ●      |
| .084            | M 5   | 0.80 | 70  | 15 | 25.0 | 6.0  | 4.9 | 3 | 4.30   | ●      |
| .088            | M 6   | 1.00 | 80  | 17 | 30.0 | 6.0  | 4.9 | 3 | 5.10   | ●      |
| .160            | M 8   | 1.25 | 90  | 20 | 35.0 | 8.0  | 6.2 | 3 | 6.90   | ●      |
| .174            | M10   | 1.50 | 100 | 22 | 39.0 | 10.0 | 8.0 | 3 | 8.60   | ●      |

| Exemple: N° cde                      |     |      |     |    |      |      |      |   |       | TRIBO  |
|--------------------------------------|-----|------|-----|----|------|------|------|---|-------|--------|
| N° d'article                         |     |      |     |    |      |      |      |   |       | ET0401 |
| Code-ø                               |     |      |     |    |      |      |      |   |       |        |
| Ø Code                               | d   | P    | L   | l  | l1   | d1   | a    |   |       |        |
| .240                                 | M12 | 1.75 | 110 | 24 | 40.0 | 9.0  | 7.0  | 3 | 10.40 | ●      |
| .244                                 | M14 | 2.00 | 110 | 26 | 40.0 | 11.0 | 9.0  | 3 | 12.20 | ●      |
| .246                                 | M16 | 2.00 | 110 | 27 | 40.0 | 12.0 | 9.0  | 3 | 14.20 | ●      |
| .312                                 | M18 | 2.50 | 125 | 30 | 45.0 | 14.0 | 11.0 | 4 | 15.70 | ●      |
| .314                                 | M20 | 2.50 | 140 | 32 | 50.0 | 16.0 | 12.0 | 4 | 17.70 | ●      |
| .316                                 | M22 | 2.50 | 140 | 32 | 50.0 | 18.0 | 14.5 | 4 | 19.70 | ●      |
| .320                                 | M24 | 3.00 | 160 | 34 | 60.0 | 18.0 | 14.5 | 4 | 21.20 | ●      |
| * La dimension donnée est hors norme |     |      |     |    |      |      |      |   |       |        |



Tarauds x-tap



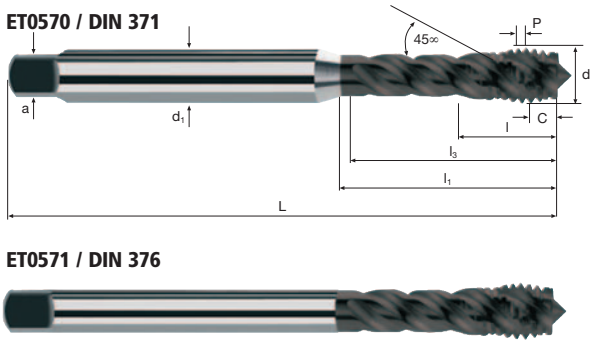
M

ISO 2  
(6H)

HSS  
PM/F

DIN  
371/376

Form C

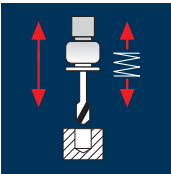


Inox  
Stainless

| Exemple: N° cde |       |      |     |    |      |      |      |     |   |        | TRIBO  |
|-----------------|-------|------|-----|----|------|------|------|-----|---|--------|--------|
| N° d'article    |       |      |     |    |      |      |      |     |   |        | ET0570 |
| Code-ø          |       |      |     |    |      |      |      |     |   |        |        |
| Ø Code          | d     | P    | L   | l  | l1   | l3   | d1   | a   |   |        |        |
| .034            | M 2   | 0.40 | 45  | 8  | —    | 10.5 | 2.8  | 2.1 | 3 | 1.70 * | ●      |
| .040            | M 2.5 | 0.45 | 50  | 9  | —    | 13.0 | 2.8  | 2.1 | 3 | 2.10   | ●      |
| .044            | M 3   | 0.50 | 56  | 5  | —    | 16.0 | 3.5  | 2.7 | 3 | 2.60 * | ●      |
| .058            | M 4   | 0.70 | 63  | 7  | —    | 19.0 | 4.5  | 3.4 | 3 | 3.40   | ●      |
| .084            | M 5   | 0.80 | 70  | 8  | —    | 23.0 | 6.0  | 4.9 | 3 | 4.30   | ●      |
| .088            | M 6   | 1.00 | 80  | 10 | —    | 28.0 | 6.0  | 4.9 | 3 | 5.10   | ●      |
| .160            | M 8   | 1.25 | 90  | 13 | 35.0 | 33.0 | 8.0  | 6.2 | 3 | 6.90   | ●      |
| .174            | M10   | 1.50 | 100 | 15 | 39.0 | 37.0 | 10.0 | 8.0 | 4 | 8.60   | ●      |

| Exemple: N° cde                      |     |      |     |    |      |      |      |      |   |       | TRIBO  |
|--------------------------------------|-----|------|-----|----|------|------|------|------|---|-------|--------|
| N° d'article                         |     |      |     |    |      |      |      |      |   |       | ET0571 |
| Code-ø                               |     |      |     |    |      |      |      |      |   |       |        |
| Ø Code                               | d   | P    | L   | l  | l1   | l3   | d1   | a    |   |       |        |
| .240                                 | M12 | 1.75 | 110 | 18 | 50.0 | 48.0 | 9.0  | 7.0  | 4 | 10.40 | ●      |
| .244                                 | M14 | 2.00 | 110 | 20 | 58.0 | 56.0 | 11.0 | 9.0  | 4 | 12.20 | ●      |
| .246                                 | M16 | 2.00 | 110 | 20 | 58.0 | 56.0 | 12.0 | 9.0  | 4 | 14.20 | ●      |
| .312                                 | M18 | 2.50 | 125 | 25 | 65.0 | 63.0 | 14.0 | 11.0 | 4 | 15.70 | ●      |
| .314                                 | M20 | 2.50 | 140 | 25 | 72.0 | 70.0 | 16.0 | 12.0 | 4 | 17.70 | ●      |
| .316                                 | M22 | 2.50 | 140 | 25 | 72.0 | 70.0 | 18.0 | 14.5 | 5 | 19.70 | ●      |
| .320                                 | M24 | 3.00 | 160 | 30 | 74.0 | 72.0 | 18.0 | 14.5 | 5 | 21.20 | ●      |
| * La dimension donnée est hors norme |     |      |     |    |      |      |      |      |   |       |        |

## Application



# Matières

## Aciers inoxydables ferritique/martensitique

[illegible]

# Matières

## Aciers inoxydables [Cr-Ni-Mo-.../1.4571]

[illegible]

# Tarauds x-tap

Incool

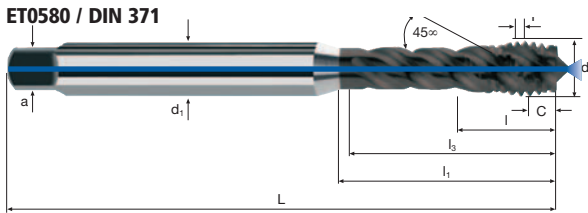


**M** **ISO 2 (6H)**

**HSS PM/F**

**DIN 371/376**

**Form C**



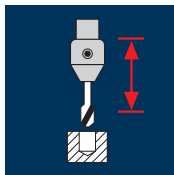
**ET0581 / DIN 376**



|                    |              |      |        |    |    |    |      |     |   |      | TRIBO  |
|--------------------|--------------|------|--------|----|----|----|------|-----|---|------|--------|
|                    |              |      |        |    |    |    |      |     |   |      | ET0580 |
| Exemple:<br>N° cde | N° d'article |      | Code-ø |    |    |    |      |     |   |      |        |
| ø<br>Code          | d            | P    | L      | l  | l1 | l3 | d1   | a   |   |      |        |
| .058               | M 4          | 0.70 | 63     | 7  | —  | 19 | 4.5  | 3.4 | 3 | 3.40 | ●      |
| .084               | M 5          | 0.80 | 70     | 8  | —  | 23 | 6.0  | 4.9 | 3 | 4.30 | ●      |
| .088               | M 6          | 1.00 | 80     | 10 | —  | 28 | 6.0  | 4.9 | 3 | 5.10 | ●      |
| .160               | M 8          | 1.25 | 90     | 13 | 35 | 33 | 8.0  | 6.2 | 3 | 6.90 | ●      |
| .174               | M10          | 1.50 | 100    | 15 | 39 | 37 | 10.0 | 8.0 | 4 | 8.60 | ●      |
|                    |              |      |        |    |    |    |      |     |   |      |        |
|                    |              |      |        |    |    |    |      |     |   |      |        |
|                    |              |      |        |    |    |    |      |     |   |      |        |
|                    |              |      |        |    |    |    |      |     |   |      |        |

|                    |              |      |        |    |    |    |      |      |   |       | TRIBO  |
|--------------------|--------------|------|--------|----|----|----|------|------|---|-------|--------|
|                    |              |      |        |    |    |    |      |      |   |       | ET0581 |
| Exemple:<br>N° cde | N° d'article |      | Code-ø |    |    |    |      |      |   |       |        |
| ø<br>Code          | d            | P    | L      | l  | l1 | l3 | d1   | a    |   |       |        |
| .240               | M12          | 1.75 | 110    | 18 | 50 | 48 | 9.0  | 7.0  | 4 | 10.40 | ●      |
| .244               | M14          | 2.00 | 110    | 20 | 58 | 56 | 11.0 | 9.0  | 4 | 12.20 | ●      |
| .246               | M16          | 2.00 | 110    | 20 | 58 | 56 | 12.0 | 9.0  | 4 | 14.20 | ●      |
| .312               | M18          | 2.50 | 125    | 25 | 65 | 63 | 14.0 | 11.0 | 4 | 15.70 | ●      |
| .314               | M20          | 2.50 | 140    | 25 | 72 | 70 | 16.0 | 12.0 | 4 | 17.70 | ●      |
| .316               | M22          | 2.50 | 140    | 25 | 72 | 70 | 18.0 | 14.5 | 5 | 19.70 | ●      |
| .320               | M24          | 3.00 | 160    | 30 | 74 | 72 | 18.0 | 14.5 | 5 | 21.20 | ●      |
|                    |              |      |        |    |    |    |      |      |   |       |        |
|                    |              |      |        |    |    |    |      |      |   |       |        |

## Application



## Matières

Aciers inoxydables  
ferritique/martensitique



Aciers inoxydables  
ferritique/martensitique



Aciers inoxydables  
[Cr-Ni/1.4301]



Aciers inoxydables  
[Cr-Ni/1.4301]



| M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] |
|-----|-----------|-----------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
| M 3 | 3.0       | 0.50      | 12               | 1275                      | 10               | 1060                      | 8                | 850                       |
| M 4 | 4.0       | 0.70      | 12               | 955                       | 10               | 795                       | 8                | 635                       |
| M 5 | 5.0       | 0.80      | 12               | 765                       | 10               | 635                       | 8                | 510                       |
| M 6 | 6.0       | 1.00      | 12               | 635                       | 10               | 530                       | 8                | 425                       |
| M 8 | 8.0       | 1.25      | 12               | 475                       | 10               | 400                       | 8                | 320                       |
| M10 | 10.0      | 1.50      | 12               | 380                       | 10               | 320                       | 8                | 255                       |
| M12 | 12.0      | 1.75      | 12               | 320                       | 10               | 265                       | 8                | 210                       |
| M14 | 14.0      | 2.00      | 12               | 275                       | 10               | 225                       | 8                | 180                       |
| M16 | 16.0      | 2.00      | 12               | 240                       | 10               | 200                       | 8                | 160                       |
| M18 | 18.0      | 2.50      | 12               | 210                       | 10               | 175                       | 8                | 140                       |
| M20 | 20.0      | 2.50      | 12               | 190                       | 10               | 160                       | 8                | 125                       |
| M22 | 22.0      | 2.50      | 12               | 175                       | 10               | 145                       | 8                | 115                       |
| M24 | 24.0      | 3.00      | 12               | 160                       | 10               | 135                       | 8                | 105                       |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
| M 3 | 3.0       | 0.50      | 7                | 745                       | 5                | 530                       | 4                | 425                       |
| M 4 | 4.0       | 0.70      | 7                | 555                       | 5                | 400                       | 4                | 320                       |
| M 5 | 5.0       | 0.80      | 7                | 445                       | 5                | 320                       | 4                | 255                       |
| M 6 | 6.0       | 1.00      | 7                | 370                       | 5                | 265                       | 4                | 210                       |
| M 8 | 8.0       | 1.25      | 7                | 280                       | 5                | 200                       | 4                | 160                       |
| M10 | 10.0      | 1.50      | 7                | 225                       | 5                | 160                       | 4                | 125                       |
| M12 | 12.0      | 1.75      | 7                | 185                       | 5                | 135                       | 4                | 105                       |
| M14 | 14.0      | 2.00      | 7                | 160                       | 5                | 115                       | 4                | 90                        |
| M16 | 16.0      | 2.00      | 7                | 140                       | 5                | 100                       | 4                | 80                        |
| M18 | 18.0      | 2.50      | 7                | 125                       | 5                | 90                        | 4                | 70                        |
| M20 | 20.0      | 2.50      | 7                | 110                       | 5                | 80                        | 4                | 65                        |
| M22 | 22.0      | 2.50      | 7                | 100                       | 5                | 70                        | 4                | 60                        |
| M24 | 24.0      | 3.00      | 7                | 95                        | 5                | 65                        | 4                | 55                        |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |

## Matières

Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers réfractaires  
[17-4 PH]



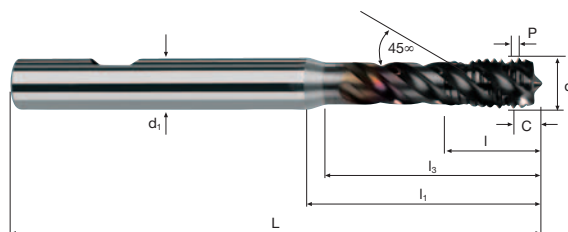
Aciers réfractaires  
[17-4 PH]



| M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] |
|-----|-----------|-----------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
| M 3 | 3.0       | 0.50      | 8                | 850                       | 6                | 635                       | 5                | 530                       |
| M 4 | 4.0       | 0.70      | 8                | 635                       | 6                | 475                       | 5                | 400                       |
| M 5 | 5.0       | 0.80      | 8                | 510                       | 6                | 380                       | 5                | 320                       |
| M 6 | 6.0       | 1.00      | 8                | 425                       | 6                | 320                       | 5                | 265                       |
| M 8 | 8.0       | 1.25      | 8                | 320                       | 6                | 240                       | 5                | 200                       |
| M10 | 10.0      | 1.50      | 8                | 255                       | 6                | 190                       | 5                | 160                       |
| M12 | 12.0      | 1.75      | 8                | 210                       | 6                | 160                       | 5                | 135                       |
| M14 | 14.0      | 2.00      | 8                | 180                       | 6                | 135                       | 5                | 115                       |
| M16 | 16.0      | 2.00      | 8                | 160                       | 6                | 120                       | 5                | 100                       |
| M18 | 18.0      | 2.50      | 8                | 140                       | 6                | 105                       | 5                | 90                        |
| M20 | 20.0      | 2.50      | 8                | 125                       | 6                | 95                        | 5                | 80                        |
| M22 | 22.0      | 2.50      | 8                | 115                       | 6                | 85                        | 5                | 70                        |
| M24 | 24.0      | 3.00      | 8                | 105                       | 6                | 80                        | 5                | 65                        |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
| M 3 | 3.0       | 0.50      | 5                | 530                       | 4                | 425                       |                  |                           |
| M 4 | 4.0       | 0.70      | 5                | 400                       | 4                | 320                       |                  |                           |
| M 5 | 5.0       | 0.80      | 5                | 320                       | 4                | 255                       |                  |                           |
| M 6 | 6.0       | 1.00      | 5                | 265                       | 4                | 210                       |                  |                           |
| M 8 | 8.0       | 1.25      | 5                | 200                       | 4                | 160                       |                  |                           |
| M10 | 10.0      | 1.50      | 5                | 160                       | 4                | 125                       |                  |                           |
| M12 | 12.0      | 1.75      | 5                | 135                       | 4                | 105                       |                  |                           |
| M14 | 14.0      | 2.00      | 5                | 115                       | 4                | 90                        |                  |                           |
| M16 | 16.0      | 2.00      | 5                | 100                       | 4                | 80                        |                  |                           |
| M18 | 18.0      | 2.50      | 5                | 90                        | 4                | 70                        |                  |                           |
| M20 | 20.0      | 2.50      | 5                | 80                        | 4                | 65                        |                  |                           |
| M22 | 22.0      | 2.50      | 5                | 70                        | 4                | 60                        |                  |                           |
| M24 | 24.0      | 3.00      | 5                | 65                        | 4                | 55                        |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |

**In**

Form C

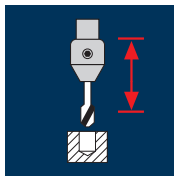


M

**Inox**  
Stainless

171

## Application



## Matières

Aciers inoxydables  
ferritique/martensitique



Aciers inoxydables  
ferritique/martensitique



Aciers inoxydables  
[Cr-Ni/1.4301]



Aciers inoxydables  
[Cr-Ni/1.4301]



| M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] |
|-----|-----------|-----------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
| M 4 | 4.0       | 0.70      | 12               | 955                       | 10               | 795                       | 8                | 635                       |
| M 5 | 5.0       | 0.80      | 12               | 765                       | 10               | 635                       | 8                | 510                       |
| M 6 | 6.0       | 1.00      | 12               | 635                       | 10               | 530                       | 8                | 425                       |
| M 8 | 8.0       | 1.25      | 12               | 475                       | 10               | 400                       | 8                | 320                       |
| M10 | 10.0      | 1.50      | 12               | 380                       | 10               | 320                       | 8                | 255                       |
| M12 | 12.0      | 1.75      | 12               | 320                       | 10               | 265                       | 8                | 210                       |
| M14 | 14.0      | 2.00      | 12               | 275                       | 10               | 225                       | 8                | 180                       |
| M16 | 16.0      | 2.00      | 12               | 240                       | 10               | 200                       | 8                | 160                       |
| M18 | 18.0      | 2.50      | 12               | 210                       | 10               | 175                       | 8                | 140                       |
| M20 | 20.0      | 2.50      | 12               | 190                       | 10               | 160                       | 8                | 125                       |
| M22 | 22.0      | 2.50      | 12               | 175                       | 10               | 145                       | 8                | 115                       |
| M24 | 24.0      | 3.00      | 12               | 160                       | 10               | 135                       | 8                | 105                       |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
| M 4 | 4.0       | 0.70      | 7                | 555                       | 5                | 400                       | 4                | 320                       |
| M 5 | 5.0       | 0.80      | 7                | 445                       | 5                | 320                       | 4                | 255                       |
| M 6 | 6.0       | 1.00      | 7                | 370                       | 5                | 265                       | 4                | 210                       |
| M 8 | 8.0       | 1.25      | 7                | 280                       | 5                | 200                       | 4                | 160                       |
| M10 | 10.0      | 1.50      | 7                | 225                       | 5                | 160                       | 4                | 125                       |
| M12 | 12.0      | 1.75      | 7                | 185                       | 5                | 135                       | 4                | 105                       |
| M14 | 14.0      | 2.00      | 7                | 160                       | 5                | 115                       | 4                | 90                        |
| M16 | 16.0      | 2.00      | 7                | 140                       | 5                | 100                       | 4                | 80                        |
| M18 | 18.0      | 2.50      | 7                | 125                       | 5                | 90                        | 4                | 70                        |
| M20 | 20.0      | 2.50      | 7                | 110                       | 5                | 80                        | 4                | 65                        |
| M22 | 22.0      | 2.50      | 7                | 100                       | 5                | 70                        | 4                | 60                        |
| M24 | 24.0      | 3.00      | 7                | 95                        | 5                | 65                        | 4                | 55                        |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |

## Matières

Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers réfractaires  
[17-4 PH]



Aciers réfractaires  
[17-4 PH]



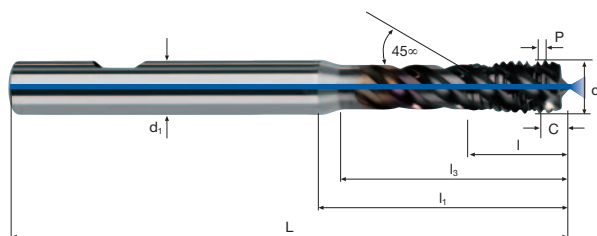
| M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] |
|-----|-----------|-----------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
| M 4 | 4.0       | 0.70      | 8                | 635                       | 6                | 475                       | 5                | 400                       |
| M 5 | 5.0       | 0.80      | 8                | 510                       | 6                | 380                       | 5                | 320                       |
| M 6 | 6.0       | 1.00      | 8                | 425                       | 6                | 320                       | 5                | 265                       |
| M 8 | 8.0       | 1.25      | 8                | 320                       | 6                | 240                       | 5                | 200                       |
| M10 | 10.0      | 1.50      | 8                | 255                       | 6                | 190                       | 5                | 160                       |
| M12 | 12.0      | 1.75      | 8                | 210                       | 6                | 160                       | 5                | 135                       |
| M14 | 14.0      | 2.00      | 8                | 180                       | 6                | 135                       | 5                | 115                       |
| M16 | 16.0      | 2.00      | 8                | 160                       | 6                | 120                       | 5                | 100                       |
| M18 | 18.0      | 2.50      | 8                | 140                       | 6                | 105                       | 5                | 90                        |
| M20 | 20.0      | 2.50      | 8                | 125                       | 6                | 95                        | 5                | 80                        |
| M22 | 22.0      | 2.50      | 8                | 115                       | 6                | 85                        | 5                | 70                        |
| M24 | 24.0      | 3.00      | 8                | 105                       | 6                | 80                        | 5                | 65                        |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
| M 4 | 4.0       | 0.70      | 5                | 400                       | 4                | 320                       |                  |                           |
| M 5 | 5.0       | 0.80      | 5                | 320                       | 4                | 255                       |                  |                           |
| M 6 | 6.0       | 1.00      | 5                | 265                       | 4                | 210                       |                  |                           |
| M 8 | 8.0       | 1.25      | 5                | 200                       | 4                | 160                       |                  |                           |
| M10 | 10.0      | 1.50      | 5                | 160                       | 4                | 125                       |                  |                           |
| M12 | 12.0      | 1.75      | 5                | 135                       | 4                | 105                       |                  |                           |
| M14 | 14.0      | 2.00      | 5                | 115                       | 4                | 90                        |                  |                           |
| M16 | 16.0      | 2.00      | 5                | 100                       | 4                | 80                        |                  |                           |
| M18 | 18.0      | 2.50      | 5                | 90                        | 4                | 70                        |                  |                           |
| M20 | 20.0      | 2.50      | 5                | 80                        | 4                | 65                        |                  |                           |
| M22 | 22.0      | 2.50      | 5                | 70                        | 4                | 60                        |                  |                           |
| M24 | 24.0      | 3.00      | 5                | 65                        | 4                | 55                        |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |
|     |           |           |                  |                           |                  |                           |                  |                           |



Incool



**ISO 2  
(6H)**



**Inox**  
Stainless

[www.fraisa.com](http://www.fraisa.com)



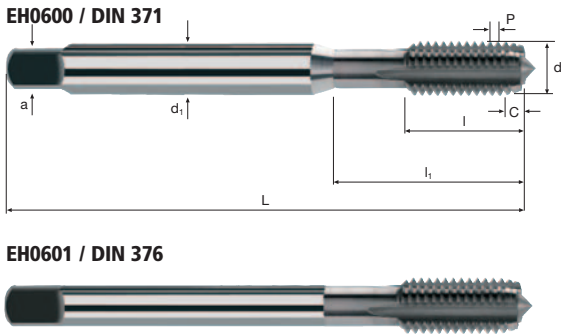


M

ISO 2  
(6H)

HSS  
PM/F

X - P  
Form C



M

GG(G)

| Exemple: N° cde |       |      |     |    |      |      |     |   |      | TiCN   |   |
|-----------------|-------|------|-----|----|------|------|-----|---|------|--------|---|
| N° d'article    |       |      |     |    |      |      |     |   |      | EH0600 |   |
| Code-ø          |       |      |     |    |      |      |     |   |      |        |   |
| Ø Code          | d     | P    | L   | l  | l1   | d1   | a   |   |      |        |   |
| .034            | M 2   | 0.40 | 45  | 8  | —    | 2.8  | 2.1 | 3 | 1.60 |        | ● |
| .040            | M 2.5 | 0.45 | 50  | 9  | —    | 2.8  | 2.1 | 3 | 2.05 |        | ● |
| .044            | M 3   | 0.50 | 56  | 12 | 18.0 | 3.5  | 2.7 | 3 | 2.50 |        | ● |
| .058            | M 4   | 0.70 | 63  | 13 | 21.0 | 4.5  | 3.4 | 3 | 3.30 |        | ● |
| .084            | M 5   | 0.80 | 70  | 15 | 25.0 | 6.0  | 4.9 | 3 | 4.20 |        | ● |
| .088            | M 6   | 1.00 | 80  | 17 | 30.0 | 6.0  | 4.9 | 4 | 5.00 |        | ● |
| .160            | M 8   | 1.25 | 90  | 20 | 35.0 | 8.0  | 6.2 | 4 | 6.80 |        | ● |
| .174            | M10   | 1.50 | 100 | 22 | 39.0 | 10.0 | 8.0 | 4 | 8.50 |        | ● |

| Exemple: N° cde |     |      |     |    |      |      |      |   |       | TiCN   |   |
|-----------------|-----|------|-----|----|------|------|------|---|-------|--------|---|
| N° d'article    |     |      |     |    |      |      |      |   |       | EH0601 |   |
| Code-ø          |     |      |     |    |      |      |      |   |       |        |   |
| Ø Code          | d   | P    | L   | l  | l1   | d1   | a    |   |       |        |   |
| .240            | M12 | 1.75 | 110 | 24 | 40.0 | 9.0  | 7.0  | 4 | 10.20 |        | ● |
| .244            | M14 | 2.00 | 110 | 26 | 40.0 | 11.0 | 9.0  | 4 | 12.00 |        | ● |
| .246            | M16 | 2.00 | 110 | 27 | 40.0 | 12.0 | 9.0  | 4 | 14.00 |        | ● |
| .312            | M18 | 2.50 | 125 | 30 | 45.0 | 14.0 | 11.0 | 4 | 15.50 |        | ● |
| .314            | M20 | 2.50 | 140 | 32 | 50.0 | 16.0 | 12.0 | 4 | 17.50 |        | ● |
| .316            | M22 | 2.50 | 140 | 32 | 50.0 | 18.0 | 14.5 | 5 | 19.50 |        | ● |
| .320            | M24 | 3.00 | 160 | 34 | 60.0 | 18.0 | 14.5 | 5 | 21.00 |        | ● |

| Application  | Matières    | M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[m·min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[m·min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[m·min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|--------------|-------------|-----|-----------|-----------|--------------------------------------------|---------------------------|-----------------|--------------------------------------------|---------------------------|-----------------|--------------------------------------------|---------------------------|-----------------|
|              | Fonte<br>GG | M 4 | 4.0       | 0.70      | 28                                         | 2230                      | 1561            | 24                                         | 1910                      | 1337            | 20                                         | 1590                      | 1113            |
|              |             | M 5 | 5.0       | 0.80      | 28                                         | 1785                      | 1428            | 24                                         | 1530                      | 1224            | 20                                         | 1275                      | 1020            |
|              |             | M 6 | 6.0       | 1.00      | 28                                         | 1485                      | 1485            | 24                                         | 1275                      | 1275            | 20                                         | 1060                      | 1060            |
|              |             | M 8 | 8.0       | 1.25      | 28                                         | 1115                      | 1394            | 24                                         | 955                       | 1194            | 20                                         | 795                       | 994             |
|              |             | M10 | 10.0      | 1.50      | 28                                         | 890                       | 1335            | 24                                         | 765                       | 1148            | 20                                         | 635                       | 953             |
|              |             | M12 | 12.0      | 1.75      | 28                                         | 745                       | 1304            | 24                                         | 635                       | 1111            | 20                                         | 530                       | 928             |
|              |             | M14 | 14.0      | 2.00      | 28                                         | 635                       | 1270            | 24                                         | 545                       | 1090            | 20                                         | 455                       | 910             |
|              |             | M16 | 16.0      | 2.00      | 28                                         | 555                       | 1110            | 24                                         | 475                       | 950             | 20                                         | 400                       | 800             |
|              |             | M18 | 18.0      | 2.50      | 28                                         | 495                       | 1238            | 24                                         | 425                       | 1063            | 20                                         | 355                       | 888             |
|              |             | M20 | 20.0      | 2.50      | 28                                         | 445                       | 1113            | 24                                         | 380                       | 950             | 20                                         | 320                       | 800             |
|              |             | M22 | 22.0      | 2.50      | 28                                         | 405                       | 1013            | 24                                         | 345                       | 863             | 20                                         | 290                       | 725             |
|              |             | M24 | 24.0      | 3.00      | 28                                         | 370                       | 1110            | 24                                         | 320                       | 960             | 20                                         | 265                       | 795             |
|              |             |     |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|              |             |     |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|              |             |     |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|              |             |     |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
| Fonte<br>GGG |             | M 4 | 4.0       | 0.40      | 20                                         | 1590                      | 636             | 18                                         | 1430                      | 572             | 15                                         | 1195                      | 478             |
|              |             | M 5 | 5.0       | 0.45      | 20                                         | 1275                      | 574             | 18                                         | 1145                      | 515             | 15                                         | 955                       | 430             |
|              |             | M 6 | 6.0       | 0.50      | 20                                         | 1060                      | 530             | 18                                         | 955                       | 478             | 15                                         | 795                       | 398             |
|              |             | M 8 | 8.0       | 0.70      | 20                                         | 795                       | 557             | 18                                         | 715                       | 500             | 15                                         | 595                       | 417             |
|              |             | M10 | 10.0      | 0.80      | 20                                         | 635                       | 508             | 18                                         | 575                       | 460             | 15                                         | 475                       | 380             |
|              |             | M12 | 12.0      | 1.00      | 20                                         | 530                       | 530             | 18                                         | 475                       | 475             | 15                                         | 400                       | 400             |
|              |             | M14 | 14.0      | 1.25      | 20                                         | 455                       | 569             | 18                                         | 410                       | 513             | 15                                         | 340                       | 425             |
|              |             | M16 | 16.0      | 1.50      | 20                                         | 400                       | 600             | 18                                         | 360                       | 540             | 15                                         | 300                       | 450             |
|              |             | M18 | 18.0      | 1.75      | 20                                         | 355                       | 621             | 18                                         | 320                       | 560             | 15                                         | 265                       | 464             |
|              |             | M20 | 20.0      | 2.00      | 20                                         | 320                       | 640             | 18                                         | 285                       | 570             | 15                                         | 240                       | 480             |
| Fonte<br>GGG |             | M22 | 22.0      | 2.00      | 20                                         | 290                       | 580             | 18                                         | 260                       | 520             | 15                                         | 215                       | 430             |
|              |             | M24 | 24.0      | 2.50      | 20                                         | 265                       | 663             | 18                                         | 240                       | 600             | 15                                         | 200                       | 500             |
|              |             |     |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|              |             |     |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |
|              |             |     |           |           |                                            |                           |                 |                                            |                           |                 |                                            |                           |                 |

# Tarauds c-tap

Incool



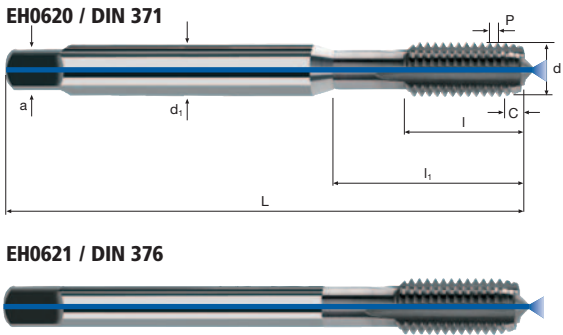
M

ISO 2  
(6H)

HSS  
PM/F

DIN  
371/376

Form C



GG(G)

| Example:<br>N° cde |     |      |     |    |                |                |     |   |      | TiCN   |   |
|--------------------|-----|------|-----|----|----------------|----------------|-----|---|------|--------|---|
| N° d'article       |     |      |     |    |                |                |     |   |      | EH0620 |   |
| Code-ø             |     |      |     |    |                |                |     |   |      |        |   |
| Ø<br>Code          | d   | P    | L   | I  | I <sub>1</sub> | d <sub>1</sub> | a   |   |      |        |   |
| .058               | M 4 | 0.70 | 63  | 13 | 21             | 4.5            | 3.4 | 3 | 3.30 |        | ● |
| .084               | M 5 | 0.80 | 70  | 15 | 25             | 6.0            | 4.9 | 3 | 4.20 |        | ● |
| .088               | M 6 | 1.00 | 80  | 17 | 30             | 6.0            | 4.9 | 4 | 5.00 |        | ● |
| .160               | M 8 | 1.25 | 90  | 20 | 35             | 8.0            | 6.2 | 4 | 6.80 |        | ● |
| .174               | M10 | 1.50 | 100 | 22 | 39             | 10.0           | 8.0 | 4 | 8.50 |        | ● |
|                    |     |      |     |    |                |                |     |   |      |        |   |
|                    |     |      |     |    |                |                |     |   |      |        |   |
|                    |     |      |     |    |                |                |     |   |      |        |   |
|                    |     |      |     |    |                |                |     |   |      |        |   |

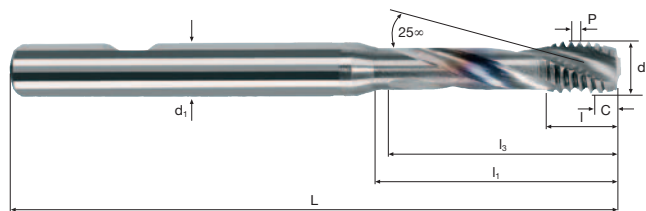
| Example:<br>N° cde |     |      |     |    |                |                |      |   |       | TiCN   |   |
|--------------------|-----|------|-----|----|----------------|----------------|------|---|-------|--------|---|
| N° d'article       |     |      |     |    |                |                |      |   |       | EH0621 |   |
| Code-ø             |     |      |     |    |                |                |      |   |       |        |   |
| Ø<br>Code          | d   | P    | L   | I  | I <sub>1</sub> | d <sub>1</sub> | a    |   |       |        |   |
| .240               | M12 | 1.75 | 110 | 24 | 40             | 9.0            | 7.0  | 4 | 10.20 |        | ● |
| .244               | M14 | 2.00 | 110 | 26 | 40             | 11.0           | 9.0  | 4 | 12.00 |        | ● |
| .246               | M16 | 2.00 | 110 | 27 | 40             | 12.0           | 9.0  | 4 | 14.00 |        | ● |
| .312               | M18 | 2.50 | 125 | 30 | 45             | 14.0           | 11.0 | 4 | 15.50 |        | ● |
| .314               | M20 | 2.50 | 140 | 32 | 50             | 16.0           | 12.0 | 4 | 17.50 |        | ● |
| .316               | M22 | 2.50 | 140 | 32 | 50             | 18.0           | 14.5 | 5 | 19.50 |        | ● |
| .320               | M24 | 3.00 | 160 | 34 | 60             | 18.0           | 14.5 | 5 | 21.00 |        | ● |
|                    |     |      |     |    |                |                |      |   |       |        |   |
|                    |     |      |     |    |                |                |      |   |       |        |   |

| Application                                                                       | Matières    | M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] |
|-----------------------------------------------------------------------------------|-------------|-----|-----------|-----------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
|  | Fonte<br>GG | M 3 | 3.0       | 0.50      | 80               | 8490                      | 70               | 7425                      | 50               | 5305                      |
|                                                                                   |             | M 4 | 4.0       | 0.70      | 80               | 6365                      | 70               | 5570                      | 50               | 3980                      |
|                                                                                   |             | M 5 | 5.0       | 0.80      | 80               | 5095                      | 70               | 4455                      | 50               | 3185                      |
|                                                                                   |             | M 6 | 6.0       | 1.00      | 80               | 4245                      | 70               | 3715                      | 50               | 2655                      |
|                                                                                   |             | M 8 | 8.0       | 1.25      | 80               | 3185                      | 70               | 2785                      | 50               | 1990                      |
|                                                                                   |             | M10 | 10.0      | 1.50      | 80               | 2545                      | 70               | 2230                      | 50               | 1590                      |
|                                                                                   |             | M12 | 12.0      | 1.75      | 80               | 2120                      | 70               | 1855                      | 50               | 1325                      |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
| Fonte<br>GGG                                                                      |             | M 3 | 3.0       | 0.50      | 60               | 6365                      | 40               | 4245                      | 30               | 3185                      |
|                                                                                   |             | M 4 | 4.0       | 0.70      | 60               | 4775                      | 40               | 3185                      | 30               | 2385                      |
|                                                                                   |             | M 5 | 5.0       | 0.80      | 60               | 3820                      | 40               | 2545                      | 30               | 1910                      |
|                                                                                   |             | M 6 | 6.0       | 1.00      | 60               | 3185                      | 40               | 2120                      | 30               | 1590                      |
|                                                                                   |             | M 8 | 8.0       | 1.25      | 60               | 2385                      | 40               | 1590                      | 30               | 1195                      |
|                                                                                   |             | M10 | 10.0      | 1.50      | 60               | 1910                      | 40               | 1275                      | 30               | 955                       |
|                                                                                   |             | M12 | 12.0      | 1.75      | 60               | 1590                      | 40               | 1060                      | 30               | 795                       |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                   |             |     |           |           |                  |                           |                  |                           |                  |                           |

| Application                                                                        | Matières    | M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] |
|------------------------------------------------------------------------------------|-------------|-----|-----------|-----------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
|  | Fonte<br>GG | M 3 | 3.0       | 0.50      | 80               | 8490                      | 60               | 6365                      | 50               | 5305                      |
|                                                                                    |             | M 4 | 4.0       | 0.70      | 80               | 6365                      | 60               | 4775                      | 50               | 3980                      |
|                                                                                    |             | M 5 | 5.0       | 0.80      | 80               | 5095                      | 60               | 3820                      | 50               | 3185                      |
|                                                                                    |             | M 6 | 6.0       | 1.00      | 80               | 4245                      | 60               | 3185                      | 50               | 2655                      |
|                                                                                    |             | M 8 | 8.0       | 1.25      | 80               | 3185                      | 60               | 2385                      | 50               | 1990                      |
|                                                                                    |             | M10 | 10.0      | 1.50      | 80               | 2545                      | 60               | 1910                      | 50               | 1590                      |
|                                                                                    |             | M12 | 12.0      | 1.75      | 80               | 2120                      | 60               | 1590                      | 50               | 1325                      |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
| Fonte<br>GGG                                                                       |             | M 3 | 3.0       | 0.50      | 60               | 6365                      | 50               | 5305                      | 40               | 4245                      |
|                                                                                    |             | M 4 | 4.0       | 0.70      | 60               | 4775                      | 50               | 3980                      | 40               | 3185                      |
|                                                                                    |             | M 5 | 5.0       | 0.80      | 60               | 3820                      | 50               | 3185                      | 40               | 2545                      |
|                                                                                    |             | M 6 | 6.0       | 1.00      | 60               | 3185                      | 50               | 2655                      | 40               | 2120                      |
|                                                                                    |             | M 8 | 8.0       | 1.25      | 60               | 2385                      | 50               | 1990                      | 40               | 1590                      |
|                                                                                    |             | M10 | 10.0      | 1.50      | 60               | 1910                      | 50               | 1590                      | 40               | 1275                      |
|                                                                                    |             | M12 | 12.0      | 1.75      | 60               | 1590                      | 50               | 1325                      | 40               | 1060                      |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                    |             |     |           |           |                  |                           |                  |                           |                  |                           |



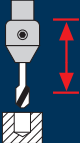
**ISO 2**  
**(6H)**



M

GG(G)

[www.fraisa.com](http://www.fraisa.com)

| Application                                                                       | Matières    | M   | ø    | P    | $v_c$          | n                    | $v_c$          | n                    | $v_c$          | n                    |
|-----------------------------------------------------------------------------------|-------------|-----|------|------|----------------|----------------------|----------------|----------------------|----------------|----------------------|
|                                                                                   |             |     | [mm] | [mm] | $1.0 \times d$ | [min <sup>-1</sup> ] | $1.5 \times d$ | [min <sup>-1</sup> ] | $2.0 \times d$ | [min <sup>-1</sup> ] |
|  | Fonte<br>GG | M 6 | 6.0  | 1.00 | 80             | 4245                 | 70             | 3715                 | 50             | 2655                 |
|                                                                                   |             | M 8 | 8.0  | 1.25 | 80             | 3185                 | 70             | 2785                 | 50             | 1990                 |
|                                                                                   |             | M10 | 10.0 | 1.50 | 80             | 2545                 | 70             | 2230                 | 50             | 1590                 |
|                                                                                   |             | M12 | 12.0 | 1.75 | 80             | 2120                 | 70             | 1855                 | 50             | 1325                 |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
| Fonte<br>GGG                                                                      |             | M 6 | 6.0  | 1.00 | 60             | 3185                 | 40             | 2120                 | 30             | 1590                 |
|                                                                                   |             | M 8 | 8.0  | 1.25 | 60             | 2385                 | 40             | 1590                 | 30             | 1195                 |
|                                                                                   |             | M10 | 10.0 | 1.50 | 60             | 1910                 | 40             | 1275                 | 30             | 955                  |
|                                                                                   |             | M12 | 12.0 | 1.75 | 60             | 1590                 | 40             | 1060                 | 30             | 795                  |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |             |     |      |      |                |                      |                |                      |                |                      |

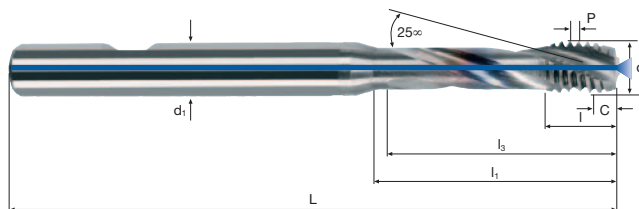


Incool



M

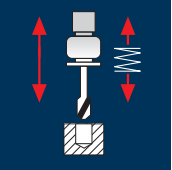
**ISO 2**  
**(6H)**

HM  
MG10

M

GG(G)

[illegible]

| Application                                                                      | Matières    | M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] |
|----------------------------------------------------------------------------------|-------------|-----|-----------|-----------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
|  | Fonte<br>GG | M 3 | 3.0       | 0.50      | 80               | 8490                      | 70               | 7425                      | 50               | 5305                      |
|                                                                                  |             | M 4 | 4.0       | 0.70      | 80               | 6365                      | 70               | 5570                      | 50               | 3980                      |
|                                                                                  |             | M 5 | 5.0       | 0.80      | 80               | 5095                      | 70               | 4455                      | 50               | 3185                      |
|                                                                                  |             | M 6 | 6.0       | 1.00      | 80               | 4245                      | 70               | 3715                      | 50               | 2655                      |
|                                                                                  |             | M 8 | 8.0       | 1.25      | 80               | 3185                      | 70               | 2785                      | 50               | 1990                      |
|                                                                                  |             | M10 | 10.0      | 1.50      | 80               | 2545                      | 70               | 2230                      | 50               | 1590                      |
|                                                                                  |             | M12 | 12.0      | 1.75      | 80               | 2120                      | 70               | 1855                      | 50               | 1325                      |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
| Fonte<br>GGG                                                                     |             | M 3 | 3.0       | 0.50      | 60               | 6365                      | 40               | 4245                      | 30               | 3185                      |
|                                                                                  |             | M 4 | 4.0       | 0.70      | 60               | 4775                      | 40               | 3185                      | 30               | 2385                      |
|                                                                                  |             | M 5 | 5.0       | 0.80      | 60               | 3820                      | 40               | 2545                      | 30               | 1910                      |
|                                                                                  |             | M 6 | 6.0       | 1.00      | 60               | 3185                      | 40               | 2120                      | 30               | 1590                      |
|                                                                                  |             | M 8 | 8.0       | 1.25      | 60               | 2385                      | 40               | 1590                      | 30               | 1195                      |
|                                                                                  |             | M10 | 10.0      | 1.50      | 60               | 1910                      | 40               | 1275                      | 30               | 955                       |
|                                                                                  |             | M12 | 12.0      | 1.75      | 60               | 1590                      | 40               | 1060                      | 30               | 795                       |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                  |             |     |           |           |                  |                           |                  |                           |                  |                           |

Tarauds    durotap GG

Incool

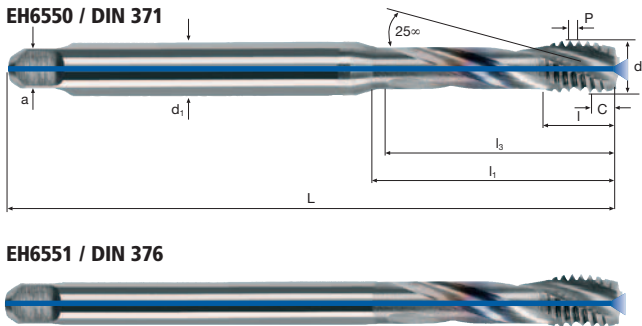


M

ISO 2  
(6H)

HM  
MG10

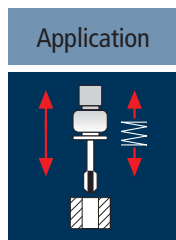
X - P  
Form C



GG(G)

| Exemple: N° cde |     |      |     |    |    |    |      |     |   |      | TiCN   |
|-----------------|-----|------|-----|----|----|----|------|-----|---|------|--------|
| N° d'article    |     |      |     |    |    |    |      |     |   |      | EH6550 |
| Code-ø          |     |      |     |    |    |    |      |     |   |      |        |
| Ø Code          | d   | P    | L   | l  | l1 | l3 | d1   | a   |   |      |        |
| .044 *          | M 3 | 0.50 | 56  | 5  | 18 | 16 | 3.5  | 2.7 | 3 | 2.50 | ●      |
| .058 *          | M 4 | 0.70 | 63  | 7  | 21 | 19 | 4.5  | 3.4 | 3 | 3.30 | ●      |
| .084 *          | M 5 | 0.80 | 70  | 8  | 25 | 23 | 6.0  | 4.9 | 3 | 4.20 | ●      |
| .088            | M 6 | 1.00 | 80  | 10 | 30 | 28 | 6.0  | 4.9 | 3 | 5.00 | ●      |
| .160            | M 8 | 1.25 | 90  | 13 | 35 | 33 | 8.0  | 6.2 | 3 | 6.80 | ●      |
| .174            | M10 | 1.50 | 100 | 15 | 39 | 37 | 10.0 | 8.0 | 3 | 8.50 | ●      |
|                 |     |      |     |    |    |    |      |     |   |      |        |
|                 |     |      |     |    |    |    |      |     |   |      |        |
|                 |     |      |     |    |    |    |      |     |   |      |        |

| Exemple: N° cde                 |     |      |     |    |    |    |     |     |   |       | TiCN   |
|---------------------------------|-----|------|-----|----|----|----|-----|-----|---|-------|--------|
| N° d'article                    |     |      |     |    |    |    |     |     |   |       | EH6551 |
| Code-ø                          |     |      |     |    |    |    |     |     |   |       |        |
| Ø Code                          | d   | P    | L   | l  | l1 | l3 | d1  | a   |   |       |        |
| .240                            | M12 | 1.75 | 110 | 18 | 50 | 48 | 9.0 | 7.0 | 3 | 10.20 | ●      |
|                                 |     |      |     |    |    |    |     |     |   |       |        |
|                                 |     |      |     |    |    |    |     |     |   |       |        |
|                                 |     |      |     |    |    |    |     |     |   |       |        |
|                                 |     |      |     |    |    |    |     |     |   |       |        |
|                                 |     |      |     |    |    |    |     |     |   |       |        |
|                                 |     |      |     |    |    |    |     |     |   |       |        |
| * Sans réfrigération intérieure |     |      |     |    |    |    |     |     |   |       |        |



## Application

### Matières

#### Aluminium non-allié

#### Aluminium non-allié

#### Aluminium corroyé Si < 6% non trempé

#### Aluminium corroyé Si < 6% non trempé

| M     | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] |
|-------|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
| M 2   | 2.0       | 0.40      | 23               | 3660                      | 1464            | 19               | 3025                      | 1210            | 16               | 2545                      | 1018            |
| M 2.5 | 2.5       | 0.45      | 23               | 2930                      | 1319            | 19               | 2420                      | 1089            | 16               | 2035                      | 916             |
| M 3   | 3.0       | 0.50      | 23               | 2440                      | 1220            | 19               | 2015                      | 1008            | 16               | 1700                      | 850             |
| M 4   | 4.0       | 0.70      | 23               | 1830                      | 1281            | 19               | 1510                      | 1057            | 16               | 1275                      | 893             |
| M 5   | 5.0       | 0.80      | 23               | 1465                      | 1172            | 19               | 1210                      | 968             | 16               | 1020                      | 816             |
| M 6   | 6.0       | 1.00      | 23               | 1220                      | 1220            | 19               | 1010                      | 1010            | 16               | 850                       | 850             |
| M 8   | 8.0       | 1.25      | 23               | 915                       | 1144            | 19               | 755                       | 944             | 16               | 635                       | 794             |
| M10   | 10.0      | 1.50      | 23               | 730                       | 1095            | 19               | 605                       | 908             | 16               | 510                       | 765             |
| M12   | 12.0      | 1.75      | 23               | 610                       | 1068            | 19               | 505                       | 884             | 16               | 425                       | 744             |
| M14   | 14.0      | 2.00      | 23               | 525                       | 1050            | 19               | 430                       | 860             | 16               | 365                       | 730             |
| M16   | 16.0      | 2.00      | 23               | 460                       | 920             | 19               | 380                       | 760             | 16               | 320                       | 640             |
| M18   | 18.0      | 2.50      | 23               | 405                       | 1013            | 19               | 335                       | 838             | 16               | 285                       | 713             |
| M20   | 20.0      | 2.50      | 23               | 365                       | 913             | 19               | 300                       | 750             | 16               | 255                       | 638             |
| M22   | 22.0      | 2.50      | 23               | 335                       | 838             | 19               | 275                       | 688             | 16               | 230                       | 575             |
| M24   | 24.0      | 3.00      | 23               | 305                       | 915             | 19               | 250                       | 750             | 16               | 210                       | 630             |
| M 2   | 2.0       | 0.40      | 35               | 5570                      | 2228            | 30               | 4775                      | 1910            | 25               | 3980                      | 1592            |
| M 2.5 | 2.5       | 0.45      | 35               | 4455                      | 2005            | 30               | 3820                      | 1719            | 25               | 3185                      | 1433            |
| M 3   | 3.0       | 0.50      | 35               | 3715                      | 1858            | 30               | 3185                      | 1593            | 25               | 2655                      | 1328            |
| M 4   | 4.0       | 0.70      | 35               | 2785                      | 1949            | 30               | 2385                      | 1670            | 25               | 1990                      | 1393            |
| M 5   | 5.0       | 0.80      | 35               | 2230                      | 1784            | 30               | 1910                      | 1528            | 25               | 1590                      | 1272            |
| M 6   | 6.0       | 1.00      | 35               | 1855                      | 1855            | 30               | 1590                      | 1590            | 25               | 1325                      | 1325            |
| M 8   | 8.0       | 1.25      | 35               | 1395                      | 1744            | 30               | 1195                      | 1494            | 25               | 995                       | 1244            |
| M10   | 10.0      | 1.50      | 35               | 1115                      | 1673            | 30               | 955                       | 1433            | 25               | 795                       | 1193            |
| M12   | 12.0      | 1.75      | 35               | 930                       | 1628            | 30               | 795                       | 1391            | 25               | 665                       | 1164            |
| M14   | 14.0      | 2.00      | 35               | 795                       | 1590            | 30               | 680                       | 1360            | 25               | 570                       | 1140            |
| M16   | 16.0      | 2.00      | 35               | 695                       | 1390            | 30               | 595                       | 1190            | 25               | 495                       | 990             |
| M18   | 18.0      | 2.50      | 35               | 620                       | 1550            | 30               | 530                       | 1325            | 25               | 440                       | 1100            |
| M20   | 20.0      | 2.50      | 35               | 555                       | 1388            | 30               | 475                       | 1188            | 25               | 400                       | 1000            |
| M22   | 22.0      | 2.50      | 35               | 505                       | 1263            | 30               | 435                       | 1088            | 25               | 360                       | 900             |
| M24   | 24.0      | 3.00      | 35               | 465                       | 1395            | 30               | 400                       | 1200            | 25               | 330                       | 990             |

### Matières

#### Aluminium corroyé Si < 6% trempé

#### Aluminium corroyé Si < 6% trempé

#### Cuivre non-allié

#### Cuivre non-allié

| M     | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] |
|-------|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
| M 2   | 2.0       | 0.40      | 20               | 3185                      | 1274            | 17               | 2705                      | 1082            | 14               | 2230                      | 892             |
| M 2.5 | 2.5       | 0.45      | 20               | 2545                      | 1145            | 17               | 2165                      | 974             | 14               | 1785                      | 803             |
| M 3   | 3.0       | 0.50      | 20               | 2120                      | 1060            | 17               | 1805                      | 903             | 14               | 1485                      | 743             |
| M 4   | 4.0       | 0.70      | 20               | 1590                      | 1113            | 17               | 1355                      | 948             | 14               | 1115                      | 781             |
| M 5   | 5.0       | 0.80      | 20               | 1275                      | 1020            | 17               | 1080                      | 864             | 14               | 890                       | 712             |
| M 6   | 6.0       | 1.00      | 20               | 1060                      | 1060            | 17               | 900                       | 900             | 14               | 745                       | 745             |
| M 8   | 8.0       | 1.25      | 20               | 795                       | 994             | 17               | 675                       | 844             | 14               | 555                       | 694             |
| M10   | 10.0      | 1.50      | 20               | 635                       | 953             | 17               | 540                       | 810             | 14               | 445                       | 668             |
| M12   | 12.0      | 1.75      | 20               | 530                       | 928             | 17               | 450                       | 788             | 14               | 370                       | 648             |
| M14   | 14.0      | 2.00      | 20               | 455                       | 910             | 17               | 385                       | 770             | 14               | 320                       | 640             |
| M16   | 16.0      | 2.00      | 20               | 400                       | 800             | 17               | 340                       | 680             | 14               | 280                       | 560             |
| M18   | 18.0      | 2.50      | 20               | 355                       | 888             | 17               | 300                       | 750             | 14               | 250                       | 625             |
| M20   | 20.0      | 2.50      | 20               | 320                       | 800             | 17               | 270                       | 675             | 14               | 225                       | 563             |
| M22   | 22.0      | 2.50      | 20               | 290                       | 725             | 17               | 245                       | 613             | 14               | 205                       | 513             |
| M24   | 24.0      | 3.00      | 20               | 265                       | 795             | 17               | 225                       | 675             | 14               | 185                       | 555             |
| M 2   | 2.0       | 0.40      | 21               | 3340                      | 1336            | 18               | 2865                      | 1146            | 15               | 2385                      | 954             |
| M 2.5 | 2.5       | 0.45      | 21               | 2675                      | 1204            | 18               | 2290                      | 1031            | 15               | 1910                      | 860             |
| M 3   | 3.0       | 0.50      | 21               | 2230                      | 1115            | 18               | 1910                      | 955             | 15               | 1590                      | 795             |
| M 4   | 4.0       | 0.70      | 21               | 1670                      | 1169            | 18               | 1430                      | 1001            | 15               | 1195                      | 837             |
| M 5   | 5.0       | 0.80      | 21               | 1335                      | 1068            | 18               | 1145                      | 916             | 15               | 955                       | 764             |
| M 6   | 6.0       | 1.00      | 21               | 1115                      | 1115            | 18               | 955                       | 955             | 15               | 795                       | 795             |
| M 8   | 8.0       | 1.25      | 21               | 835                       | 1044            | 18               | 715                       | 894             | 15               | 595                       | 744             |
| M10   | 10.0      | 1.50      | 21               | 670                       | 1005            | 18               | 575                       | 863             | 15               | 475                       | 713             |
| M12   | 12.0      | 1.75      | 21               | 555                       | 971             | 18               | 475                       | 831             | 15               | 400                       | 700             |
| M14   | 14.0      | 2.00      | 21               | 475                       | 950             | 18               | 410                       | 820             | 15               | 340                       | 680             |
| M16   | 16.0      | 2.00      | 21               | 420                       | 840             | 18               | 360                       | 720             | 15               | 300                       | 600             |
| M18   | 18.0      | 2.50      | 21               | 370                       | 925             | 18               | 320                       | 800             | 15               | 265                       | 663             |
| M20   | 20.0      | 2.50      | 21               | 335                       | 838             | 18               | 285                       | 713             | 15               | 240                       | 600             |
| M22   | 22.0      | 2.50      | 21               | 305                       | 763             | 18               | 260                       | 650             | 15               | 215                       | 538             |
| M24   | 24.0      | 3.00      | 21               | 280                       | 840             | 18               | 240                       | 720             | 15               | 200                       | 600             |



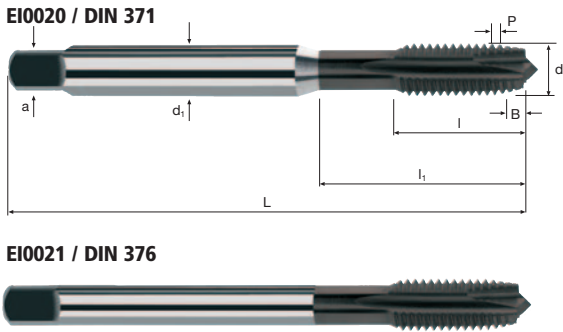
M

ISO 2  
(6H)

HSS  
PM/F

DIN  
371/376

Form B



Al  
Aluminium  
> 99%

Al  
Aluminium  
Alloy

Al  
Aluminium  
Cast

Cu  
Copper

Plastic  
Thermoplast

| Exemple: N° cde |       |      |     |    |                |                |     |   |      | INTEGRAL |   |
|-----------------|-------|------|-----|----|----------------|----------------|-----|---|------|----------|---|
|                 |       |      |     |    |                |                |     |   |      | EI0020   |   |
| Ø<br>Code       | d     | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   |      |          |   |
| .034            | M 2   | 0.40 | 45  | 8  | —              | 2.8            | 2.1 | 2 | 1.60 |          | ● |
| .040            | M 2.5 | 0.45 | 50  | 9  | —              | 2.8            | 2.1 | 2 | 2.05 |          | ● |
| .044            | M 3   | 0.50 | 56  | 12 | 18.0           | 3.5            | 2.7 | 2 | 2.50 |          | ● |
| .058            | M 4   | 0.70 | 63  | 13 | 21.0           | 4.5            | 3.4 | 2 | 3.30 |          | ● |
| .084            | M 5   | 0.80 | 70  | 15 | 25.0           | 6.0            | 4.9 | 2 | 4.20 |          | ● |
| .088            | M 6   | 1.00 | 80  | 17 | 30.0           | 6.0            | 4.9 | 2 | 5.00 |          | ● |
| .160            | M 8   | 1.25 | 90  | 20 | 35.0           | 8.0            | 6.2 | 2 | 6.80 |          | ● |
| .174            | M10   | 1.50 | 100 | 22 | 39.0           | 10.0           | 8.0 | 2 | 8.50 |          | ● |

| Exemple: N° cde |     |      |     |    |                |                |      |   |       | INTEGRAL |   |
|-----------------|-----|------|-----|----|----------------|----------------|------|---|-------|----------|---|
|                 |     |      |     |    |                |                |      |   |       | EI0021   |   |
| Ø<br>Code       | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a    |   |       |          |   |
| .240            | M12 | 1.75 | 110 | 24 | 40.0           | 9.0            | 7.0  | 3 | 10.20 |          | ● |
| .244            | M14 | 2.00 | 110 | 26 | 40.0           | 11.0           | 9.0  | 3 | 12.00 |          | ● |
| .246            | M16 | 2.00 | 110 | 27 | 40.0           | 12.0           | 9.0  | 3 | 14.00 |          | ● |
| .312            | M18 | 2.50 | 125 | 30 | 45.0           | 14.0           | 11.0 | 3 | 15.50 |          | ● |
| .314            | M20 | 2.50 | 140 | 32 | 50.0           | 16.0           | 12.0 | 3 | 17.50 |          | ● |
| .316            | M22 | 2.50 | 140 | 32 | 50.0           | 18.0           | 14.5 | 3 | 19.50 |          | ● |
| .320            | M24 | 3.00 | 160 | 34 | 60.0           | 18.0           | 14.5 | 3 | 21.00 |          | ● |





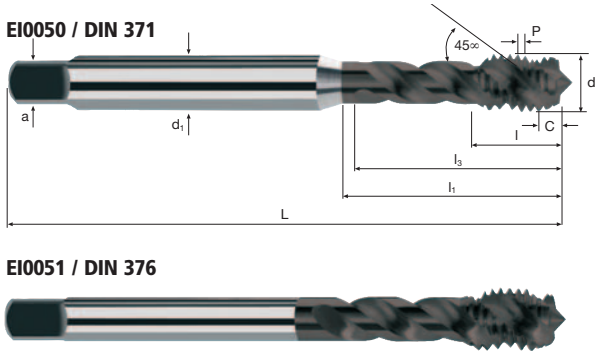
M

ISO 2  
(6H)

HSS  
PM/F

DIN  
371/376

Form C



Al  
Aluminium  
> 99%

Al  
Aluminium  
Alloy

Al  
Aluminium  
Cast

Cu  
Copper

Plastic  
Thermoplast

|           |       |      |     |    |      |      |      |     |   |      | INTEGRAL |
|-----------|-------|------|-----|----|------|------|------|-----|---|------|----------|
|           |       |      |     |    |      |      |      |     |   |      | E10050   |
| Ø<br>Code | d     | P    | L   | l  | l1   | l2   | d1   | a   |   |      |          |
| .034      | M 2   | 0.40 | 45  | 8  | —    | 10.5 | 2.8  | 2.1 | 3 | 1.60 | ●        |
| .040      | M 2.5 | 0.45 | 50  | 9  | —    | 13.0 | 2.8  | 2.1 | 3 | 2.05 | ●        |
| .044      | M 3   | 0.50 | 56  | 5  | 18.0 | 16.0 | 3.5  | 2.7 | 3 | 2.50 | ●        |
| .058      | M 4   | 0.70 | 63  | 7  | 21.0 | 19.0 | 4.5  | 3.4 | 3 | 3.30 | ●        |
| .084      | M 5   | 0.80 | 70  | 8  | 25.0 | 23.0 | 6.0  | 4.9 | 3 | 4.20 | ●        |
| .088      | M 6   | 1.00 | 80  | 10 | 30.0 | 28.0 | 6.0  | 4.9 | 3 | 5.00 | ●        |
| .160      | M 8   | 1.25 | 90  | 13 | 35.0 | 33.0 | 8.0  | 6.2 | 3 | 6.80 | ●        |
| .174      | M10   | 1.50 | 100 | 15 | 39.0 | 37.0 | 10.0 | 8.0 | 3 | 8.50 | ●        |

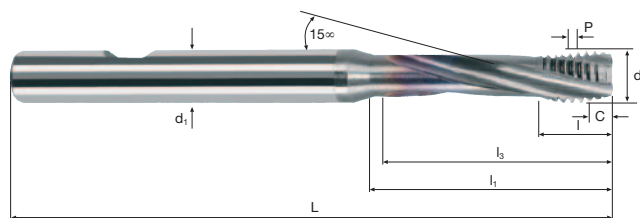
|           |     |      |     |    |      |      |      |      |   |       | INTEGRAL |
|-----------|-----|------|-----|----|------|------|------|------|---|-------|----------|
|           |     |      |     |    |      |      |      |      |   |       | E10051   |
| Ø<br>Code | d   | P    | L   | l  | l1   | l2   | d1   | a    |   |       |          |
| .240      | M12 | 1.75 | 110 | 18 | 50.0 | 48.0 | 9.0  | 7.0  | 3 | 10.20 | ●        |
| .244      | M14 | 2.00 | 110 | 20 | 58.0 | 56.0 | 11.0 | 9.0  | 4 | 12.00 | ●        |
| .246      | M16 | 2.00 | 110 | 20 | 58.0 | 56.0 | 12.0 | 9.0  | 4 | 14.00 | ●        |
| .312      | M18 | 2.50 | 125 | 25 | 65.0 | 63.0 | 14.0 | 11.0 | 4 | 15.50 | ●        |
| .314      | M20 | 2.50 | 140 | 25 | 72.0 | 70.0 | 16.0 | 12.0 | 4 | 17.50 | ●        |
| .316      | M22 | 2.50 | 140 | 25 | 72.0 | 70.0 | 18.0 | 14.5 | 4 | 19.50 | ●        |
| .320      | M24 | 3.00 | 160 | 30 | 74.0 | 72.0 | 18.0 | 14.5 | 4 | 21.00 | ●        |

[illegible][illegible]





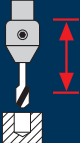
Form C



M

GG(G)

189

| Application                                                                       | Matières          | M   | ø    | P    | $v_c$          | n                    | $v_c$          | n                    | $v_c$          | n                    |
|-----------------------------------------------------------------------------------|-------------------|-----|------|------|----------------|----------------------|----------------|----------------------|----------------|----------------------|
|                                                                                   |                   |     | [mm] | [mm] | $1.0 \times d$ | [min <sup>-1</sup> ] | $1.5 \times d$ | [min <sup>-1</sup> ] | $2.0 \times d$ | [min <sup>-1</sup> ] |
|  | Fonte d'aluminium | M 6 | 6.0  | 1.00 | 80             | 4245                 | 60             | 3185                 | 40             | 2120                 |
|                                                                                   |                   | M 7 | 7.0  | 1.00 | 80             | 3640                 | 60             | 2730                 | 40             | 1820                 |
|                                                                                   |                   | M 8 | 8.0  | 1.25 | 80             | 3185                 | 60             | 2385                 | 40             | 1590                 |
|                                                                                   |                   | M10 | 10.0 | 1.50 | 80             | 2545                 | 60             | 1910                 | 40             | 1275                 |
|                                                                                   |                   |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |                   |     |      |      |                |                      |                |                      |                |                      |
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|                                                                                   |                   |     |      |      |                |                      |                |                      |                |                      |
| CuAlFe<br>(Ampco)                                                                 |                   | M 6 | 6.0  | 1.00 | 10             | 530                  | 8              | 425                  | 7              | 370                  |
|                                                                                   |                   | M 7 | 7.0  | 1.00 | 10             | 455                  | 8              | 365                  | 7              | 320                  |
|                                                                                   |                   | M 8 | 8.0  | 1.25 | 10             | 400                  | 8              | 320                  | 7              | 280                  |
|                                                                                   |                   | M10 | 10.0 | 1.50 | 10             | 320                  | 8              | 255                  | 7              | 225                  |
|                                                                                   |                   |     |      |      |                |                      |                |                      |                |                      |
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|                                                                                   |                   |     |      |      |                |                      |                |                      |                |                      |
|                                                                                   |                   |     |      |      |                |                      |                |                      |                |                      |

Incool



M

A diagram of a house-shaped polygon. The top part is a triangle with a vertex angle of  $60^\circ$ . The base of this triangle is the top edge of a rectangle. The rectangle has a height of 10 units. The total width of the house is 10 units, which is the same as the base of the triangle.

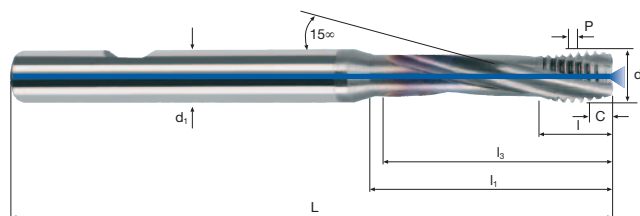
**HM  
MG10**



A cross-sectional diagram of a butt joint. Two plates, represented by diagonal hatching, are joined by a square groove weld. The weld metal is shown as a solid white area filling the square groove and extending slightly beyond the edges of the plates.



Form C



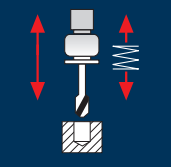
M

**Al**  
Aluminium  
Cast

**Cu**  
Copper

GG(G)

[illegible]

| Application                                                                      | Matières          | M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|----------------------------------------------------------------------------------|-------------------|-----|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
|  | Fonte d'aluminium | M 4 | 4.0       | 0.70      | 80               | 6365                      | 4456            | 60               | 4775                      | 3343            | 40               | 3185                      | 2230            |
|                                                                                  |                   | M 5 | 5.0       | 0.80      | 80               | 5095                      | 4076            | 60               | 3820                      | 3056            | 40               | 2545                      | 2036            |
|                                                                                  |                   | M 6 | 6.0       | 1.00      | 80               | 4245                      | 4245            | 60               | 3185                      | 3185            | 40               | 2120                      | 2120            |
|                                                                                  |                   | M 8 | 8.0       | 1.25      | 80               | 3185                      | 3981            | 60               | 2385                      | 2981            | 40               | 1590                      | 1988            |
|                                                                                  |                   | M10 | 10.0      | 1.50      | 80               | 2545                      | 3818            | 60               | 1910                      | 2865            | 40               | 1275                      | 1913            |
|                                                                                  |                   | M12 | 12.0      | 1.75      | 80               | 2120                      | 3710            | 60               | 1590                      | 2783            | 40               | 1060                      | 1855            |
|                                                                                  |                   | M14 | 14.0      | 2.00      | 80               | 1820                      | 3640            | 60               | 1365                      | 2730            | 40               | 910                       | 1820            |
|                                                                                  |                   | M16 | 16.0      | 2.00      | 80               | 1590                      | 3180            | 60               | 1195                      | 2390            | 40               | 795                       | 1590            |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
| CuAlFe<br>(Ampco)                                                                |                   | M 4 | 4.0       | 0.70      | 10               | 795                       | 557             | 8                | 635                       | 445             | 7                | 555                       | 389             |
|                                                                                  |                   | M 5 | 5.0       | 0.80      | 10               | 635                       | 508             | 8                | 510                       | 408             | 7                | 445                       | 356             |
|                                                                                  |                   | M 6 | 6.0       | 1.00      | 10               | 530                       | 530             | 8                | 425                       | 425             | 7                | 370                       | 370             |
|                                                                                  |                   | M 8 | 8.0       | 1.25      | 10               | 400                       | 500             | 8                | 320                       | 400             | 7                | 280                       | 350             |
|                                                                                  |                   | M10 | 10.0      | 1.50      | 10               | 320                       | 480             | 8                | 255                       | 383             | 7                | 225                       | 338             |
|                                                                                  |                   | M12 | 12.0      | 1.75      | 10               | 265                       | 464             | 8                | 210                       | 368             | 7                | 185                       | 324             |
|                                                                                  |                   | M14 | 14.0      | 2.00      | 10               | 225                       | 450             | 8                | 180                       | 360             | 7                | 160                       | 320             |
|                                                                                  |                   | M16 | 16.0      | 2.00      | 10               | 200                       | 400             | 8                | 160                       | 320             | 7                | 140                       | 280             |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|                                                                                  |                   |     |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |

Tarauds    durotap A

Incool

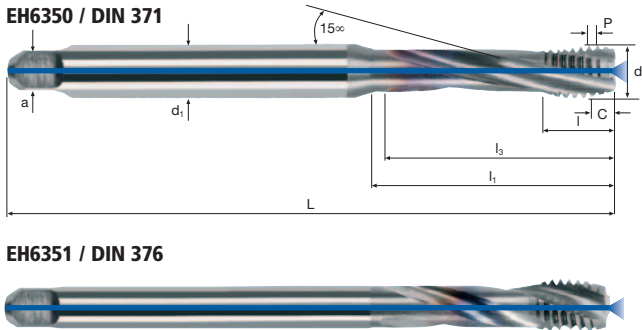


M

ISO 2  
(6H)

HM  
MG10

Form C



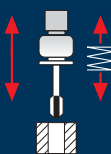
Al  
Aluminium  
Cast

Cu  
Copper

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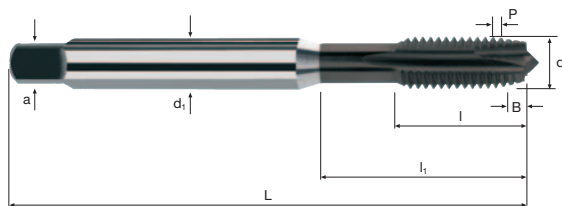
| Exemple: N° cde |     |      |     |    |    |    |      |     |   |      | TiCN   |
|-----------------|-----|------|-----|----|----|----|------|-----|---|------|--------|
| N° d'article    |     |      |     |    |    |    |      |     |   |      | EH6350 |
| Code-ø          |     |      |     |    |    |    |      |     |   |      |        |
| Ø<br>Code       | d   | P    | L   | I  | I1 | I3 | d1   | a   |   |      |        |
| .058 *          | M 4 | 0.70 | 63  | 7  | 21 | 19 | 4.5  | 3.4 | 3 | 3.30 | ●      |
| .084 *          | M 5 | 0.80 | 70  | 8  | 25 | 23 | 6.0  | 4.9 | 3 | 4.20 | ●      |
| .088            | M 6 | 1.00 | 80  | 10 | 30 | 28 | 6.0  | 4.9 | 3 | 5.00 | ●      |
| .160            | M 8 | 1.25 | 90  | 13 | 35 | 33 | 8.0  | 6.2 | 3 | 6.80 | ●      |
| .174            | M10 | 1.50 | 100 | 15 | 39 | 37 | 10.0 | 8.0 | 3 | 8.50 | ●      |
|                 |     |      |     |    |    |    |      |     |   |      |        |
|                 |     |      |     |    |    |    |      |     |   |      |        |
|                 |     |      |     |    |    |    |      |     |   |      |        |
|                 |     |      |     |    |    |    |      |     |   |      |        |

| Exemple: N° cde                 |     |      |     |    |    |    |      |     |   |       | TiCN   |
|---------------------------------|-----|------|-----|----|----|----|------|-----|---|-------|--------|
| N° d'article                    |     |      |     |    |    |    |      |     |   |       | EH6351 |
| Code-ø                          |     |      |     |    |    |    |      |     |   |       |        |
| Ø<br>Code                       | d   | P    | L   | I  | I1 | I3 | d1   | a   |   |       |        |
| .240                            | M12 | 1.75 | 110 | 18 | 50 | 48 | 9.0  | 7.0 | 3 | 10.20 | ●      |
| .244                            | M14 | 2.00 | 110 | 20 | 58 | 56 | 11.0 | 9.0 | 4 | 12.00 | ●      |
| .246                            | M16 | 2.00 | 110 | 20 | 58 | 56 | 12.0 | 9.0 | 4 | 14.00 | ●      |
|                                 |     |      |     |    |    |    |      |     |   |       |        |
|                                 |     |      |     |    |    |    |      |     |   |       |        |
|                                 |     |      |     |    |    |    |      |     |   |       |        |
|                                 |     |      |     |    |    |    |      |     |   |       |        |
| * Sans réfrigération intérieure |     |      |     |    |    |    |      |     |   |       |        |

| Application                                                                       | Matières                                                                                                                                                                                                                     |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|--|
|  | Titanes alliés trempés<br>> 300 HB<br>[ Ti6Al4V ]<br><br>  | M     | ø    | P    | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  |  |
|                                                                                   |                                                                                                                                                                                                                              | [mm]  | [mm] |      | 1.5 x d | [min <sup>-1</sup> ] | [100%] | 2.0 x d | [min <sup>-1</sup> ] | [100%] | 3.0 x d | [min <sup>-1</sup> ] | [100%] | 3.0 x d | [min <sup>-1</sup> ] | [100%] |  |
|                                                                                   |                                                                                                                                                                                                                              | M 1.2 | 1.2  | 0.25 | 4       | 1060                 | 265    | 3       | 795                  | 199    | 2       | 530                  | 133    |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              | M 1.4 | 1.4  | 0.30 | 4       | 910                  | 273    | 3       | 680                  | 204    | 2       | 455                  | 137    |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              | M 1.6 | 1.6  | 0.35 | 4       | 795                  | 278    | 3       | 595                  | 208    | 2       | 400                  | 140    |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              | M 1.8 | 1.8  | 0.35 | 4       | 705                  | 247    | 3       | 530                  | 186    | 2       | 355                  | 124    |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              | M 2   | 2.0  | 0.40 | 4       | 635                  | 254    | 3       | 475                  | 190    | 2       | 320                  | 128    |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              | M 2.5 | 2.5  | 0.45 | 4       | 510                  | 230    | 3       | 380                  | 171    | 2       | 255                  | 115    |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              | M 3   | 3.0  | 0.50 | 5       | 530                  | 265    | 4       | 425                  | 213    | 3       | 320                  | 160    |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              | M 3.5 | 3.5  | 0.60 | 5       | 455                  | 273    | 4       | 365                  | 219    | 3       | 275                  | 165    |         |                      |        |  |
| M 4                                                                               | 4.0                                                                                                                                                                                                                          | 0.70  | 5    | 400  | 280     | 4                    | 320    | 224     | 3                    | 240    | 168     |                      |        |         |                      |        |  |
|                                                                                   | Titanes alliés trempés<br>> 300 HB<br>[ Ti6Al4V ]<br><br>  | M 5   | 5.0  | 0.80 | 5       | 320                  | 256    | 4       | 255                  | 204    | 3       | 190                  | 152    |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              | M 6   | 6.0  | 1.00 | 5       | 265                  | 265    | 4       | 210                  | 210    | 3       | 160                  | 160    |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              | M 8   | 8.0  | 1.25 | 5       | 200                  | 250    | 4       | 160                  | 200    | 3       | 120                  | 150    |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              | M10   | 10.0 | 1.50 | 5       | 160                  | 240    | 4       | 125                  | 188    | 3       | 95                   | 143    |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|                                                                                   |                                                                                                                                                                                                                              |       |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |



Form B



M

**Ti**  
Titanium

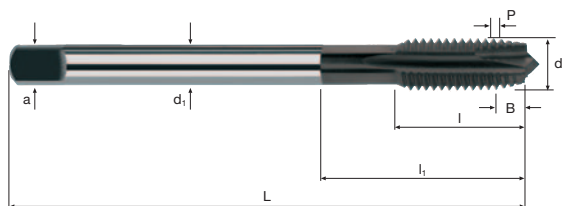
195

| Application | Matières                                                  |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|-------------|-----------------------------------------------------------|------|------|------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|--|
|             |                                                           | M    | ø    | P    | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  |  |
|             |                                                           | [mm] | [mm] |      | 1.5 x d | [min <sup>-1</sup> ] | [100%] | 2.0 x d | [min <sup>-1</sup> ] | [100%] | 3.0 x d | [min <sup>-1</sup> ] | [100%] | 3.0 x d | [min <sup>-1</sup> ] | [100%] | 3.0 x d | [min <sup>-1</sup> ] | [100%] |  |
|             | Titanes alliés trempés<br>> 300 HB<br>[ Ti6Al4V ]<br><br> | M12  | 12.0 | 1.75 | 5       | 135                  | 236    | 4       | 105                  | 184    | 3       | 80                   | 140    |         |                      |        |         |                      |        |  |
|             |                                                           | M14  | 14.0 | 2.00 | 5       | 115                  | 230    | 4       | 90                   | 180    | 3       | 70                   | 140    |         |                      |        |         |                      |        |  |
|             |                                                           | M16  | 16.0 | 2.00 | 5       | 100                  | 200    | 4       | 80                   | 160    | 3       | 60                   | 120    |         |                      |        |         |                      |        |  |
|             |                                                           | M18  | 18.0 | 2.50 | 5       | 90                   | 225    | 4       | 70                   | 175    | 3       | 55                   | 138    |         |                      |        |         |                      |        |  |
|             |                                                           | M20  | 20.0 | 2.50 | 5       | 80                   | 200    | 4       | 65                   | 163    | 3       | 50                   | 125    |         |                      |        |         |                      |        |  |
|             |                                                           | M22  | 22.0 | 2.50 | 5       | 70                   | 175    | 4       | 60                   | 150    | 3       | 45                   | 113    |         |                      |        |         |                      |        |  |
|             |                                                           | M24  | 24.0 | 3.00 | 5       | 65                   | 195    | 4       | 55                   | 165    | 3       | 40                   | 120    |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |
|             |                                                           |      |      |      |         |                      |        |         |                      |        |         |                      |        |         |                      |        |         |                      |        |  |





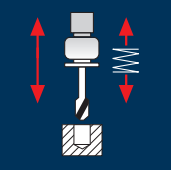
**ISO 2**  
**(6H)**



M

**Ti**  
Titanium

[illegible]

| Application                                                                      | Matières                                                                                                                                                                                                                     |       |           |           |                  |                           |                 |                  |                           |                 |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
|                                                                                  |                                                                                                                                                                                                                              | M     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|  | Titanes alliés trempés<br>> 300 HB<br>[ Ti6Al4V ]<br><br>  | M 2   | 2.0       | 0.40      | 4                | 635                       | 254             | 3                | 475                       | 190             |
|                                                                                  |                                                                                                                                                                                                                              | M 2.5 | 2.5       | 0.45      | 4                | 510                       | 230             | 3                | 380                       | 171             |
|                                                                                  |                                                                                                                                                                                                                              | M 3   | 3.0       | 0.50      | 5                | 530                       | 265             | 4                | 425                       | 213             |
|                                                                                  |                                                                                                                                                                                                                              | M 3.5 | 3.5       | 0.60      | 5                | 455                       | 273             | 4                | 365                       | 219             |
|                                                                                  |                                                                                                                                                                                                                              | M 4   | 4.0       | 0.70      | 5                | 400                       | 280             | 4                | 320                       | 224             |
|                                                                                  |                                                                                                                                                                                                                              | M 5   | 5.0       | 0.80      | 5                | 320                       | 256             | 4                | 255                       | 204             |
|                                                                                  |                                                                                                                                                                                                                              | M 6   | 6.0       | 1.00      | 5                | 265                       | 265             | 4                | 210                       | 210             |
|                                                                                  |                                                                                                                                                                                                                              | M 8   | 8.0       | 1.25      | 5                | 200                       | 250             | 4                | 160                       | 200             |
|                                                                                  |                                                                                                                                                                                                                              | M10   | 10.0      | 1.50      | 5                | 160                       | 240             | 4                | 125                       | 188             |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  | Titanes alliés trempés<br>> 300 HB<br>[ Ti6Al4V ]<br><br>  | M12   | 12.0      | 1.75      | 5                | 135                       | 236             | 4                | 105                       | 184             |
|                                                                                  |                                                                                                                                                                                                                              | M14   | 14.0      | 2.00      | 5                | 115                       | 230             | 4                | 90                        | 180             |
|                                                                                  |                                                                                                                                                                                                                              | M16   | 16.0      | 2.00      | 5                | 100                       | 200             | 4                | 80                        | 160             |
|                                                                                  |                                                                                                                                                                                                                              | M18   | 18.0      | 2.50      | 5                | 90                        | 225             | 4                | 70                        | 175             |
|                                                                                  |                                                                                                                                                                                                                              | M20   | 20.0      | 2.50      | 5                | 80                        | 200             | 4                | 65                        | 163             |
|                                                                                  |                                                                                                                                                                                                                              | M22   | 22.0      | 2.50      | 5                | 70                        | 175             | 4                | 60                        | 150             |
|                                                                                  |                                                                                                                                                                                                                              | M24   | 24.0      | 3.00      | 5                | 65                        | 195             | 4                | 55                        | 165             |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |
|                                                                                  |                                                                                                                                                                                                                              |       |           |           |                  |                           |                 |                  |                           |                 |



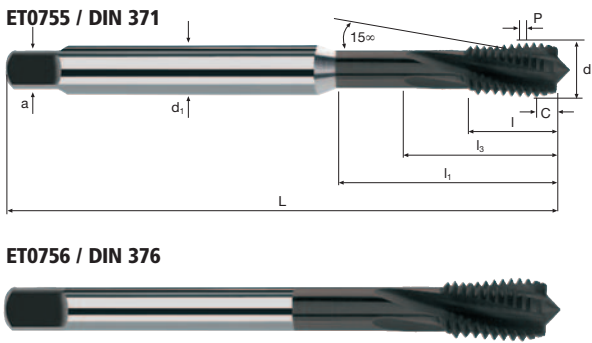
M

ISO 2  
(6H)

HSS  
PM/F

DIN  
371/376

Form C



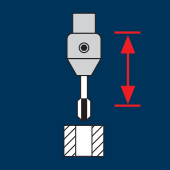
Ti  
Titanium

| Exemple: N° cde |       |      |     |    |      |      |      |     |   |        | TRIBO  |
|-----------------|-------|------|-----|----|------|------|------|-----|---|--------|--------|
| N° d'article    |       |      |     |    |      |      |      |     |   |        | ET0755 |
| Code-ø          |       |      |     |    |      |      |      |     |   |        |        |
| Ø Code          | d     | P    | L   | l  | l1   | l2   | d1   | a   |   |        |        |
| .034            | M 2   | 0.40 | 45  | 8  | —    | 10.5 | 2.8  | 2.1 | 3 | 1.70 * | ●      |
| .040            | M 2.5 | 0.45 | 50  | 9  | —    | 13.0 | 2.8  | 2.1 | 3 | 2.10   | ●      |
| .044            | M 3   | 0.50 | 56  | 5  | 18.0 | 16.0 | 3.5  | 2.7 | 3 | 2.60 * | ●      |
| .056            | M 3.5 | 0.60 | 56  | 6  | 20.0 | 18.0 | 4.0  | 3.0 | 3 | 3.00   | ●      |
| .058            | M 4   | 0.70 | 63  | 7  | 21.0 | 19.0 | 4.5  | 3.4 | 3 | 3.40   | ●      |
| .084            | M 5   | 0.80 | 70  | 8  | 25.0 | 23.0 | 6.0  | 4.9 | 3 | 4.30   | ●      |
| .088            | M 6   | 1.00 | 80  | 10 | 30.0 | 28.0 | 6.0  | 4.9 | 3 | 5.10   | ●      |
| .160            | M 8   | 1.25 | 90  | 13 | 35.0 | 33.0 | 8.0  | 6.2 | 3 | 6.90   | ●      |
| .174            | M10   | 1.50 | 100 | 15 | 39.0 | 37.0 | 10.0 | 8.0 | 4 | 8.60   | ●      |

| Exemple: N° cde                      |     |      |     |    |      |      |      |      |   |       | TRIBO  |
|--------------------------------------|-----|------|-----|----|------|------|------|------|---|-------|--------|
| N° d'article                         |     |      |     |    |      |      |      |      |   |       | ET0756 |
| Code-ø                               |     |      |     |    |      |      |      |      |   |       |        |
| Ø Code                               | d   | P    | L   | l  | l1   | l2   | d1   | a    |   |       |        |
| .240                                 | M12 | 1.75 | 110 | 18 | 50.0 | 48.0 | 9.0  | 7.0  | 4 | 10.40 | ●      |
| .244                                 | M14 | 2.00 | 110 | 20 | 58.0 | 56.0 | 11.0 | 9.0  | 4 | 12.20 | ●      |
| .246                                 | M16 | 2.00 | 110 | 20 | 58.0 | 56.0 | 12.0 | 9.0  | 4 | 14.20 | ●      |
| .312                                 | M18 | 2.50 | 125 | 25 | 65.0 | 63.0 | 14.0 | 11.0 | 5 | 15.70 | ●      |
| .314                                 | M20 | 2.50 | 140 | 25 | 72.0 | 70.0 | 16.0 | 12.0 | 5 | 17.70 | ●      |
| .316                                 | M22 | 2.50 | 140 | 25 | 72.0 | 70.0 | 18.0 | 14.5 | 5 | 19.70 | ●      |
| .320                                 | M24 | 3.00 | 160 | 30 | 74.0 | 72.0 | 18.0 | 14.5 | 5 | 21.20 | ●      |
| * La dimension donnée est hors norme |     |      |     |    |      |      |      |      |   |       |        |

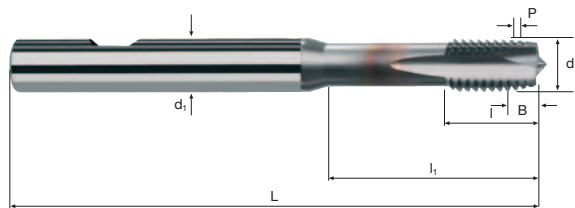




| Application                                                                      | Matières                               |     |           |           |                  |                           |                  |                           |                  |                           |
|----------------------------------------------------------------------------------|----------------------------------------|-----|-----------|-----------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>      | M   | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $V_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] |
|                                                                                  |                                        | M 3 | 3.0       | 0.50      | 25               | 2655                      | 20               | 2120                      | 15               | 1590                      |
|                                                                                  |                                        | M 4 | 4.0       | 0.70      | 25               | 1990                      | 20               | 1590                      | 15               | 1195                      |
|                                                                                  |                                        | M 5 | 5.0       | 0.80      | 25               | 1590                      | 20               | 1275                      | 15               | 955                       |
|                                                                                  |                                        | M 6 | 6.0       | 1.00      | 25               | 1325                      | 20               | 1060                      | 15               | 795                       |
|                                                                                  |                                        | M 8 | 8.0       | 1.25      | 25               | 995                       | 20               | 795                       | 15               | 595                       |
|                                                                                  |                                        | M10 | 10.0      | 1.50      | 25               | 795                       | 20               | 635                       | 15               | 475                       |
|                                                                                  |                                        | M12 | 12.0      | 1.75      | 25               | 665                       | 20               | 530                       | 15               | 400                       |
|                                                                                  |                                        | M16 | 16.0      | 2.00      | 25               | 495                       | 20               | 400                       | 15               | 300                       |
|                                                                                  |                                        | M20 | 20.0      | 2.50      | 25               | 400                       | 20               | 320                       | 15               | 240                       |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M 3 | 3.0       | 0.50      | 22               | 2335                      | 18               | 1910                      | 12               | 1275                      |
|                                                                                  |                                        | M 4 | 4.0       | 0.70      | 22               | 1750                      | 18               | 1430                      | 12               | 955                       |
|                                                                                  |                                        | M 5 | 5.0       | 0.80      | 22               | 1400                      | 18               | 1145                      | 12               | 765                       |
|                                                                                  |                                        | M 6 | 6.0       | 1.00      | 22               | 1165                      | 18               | 955                       | 12               | 635                       |
|                                                                                  |                                        | M 8 | 8.0       | 1.25      | 22               | 875                       | 18               | 715                       | 12               | 475                       |
|                                                                                  |                                        | M10 | 10.0      | 1.50      | 22               | 700                       | 18               | 575                       | 12               | 380                       |
|                                                                                  |                                        | M12 | 12.0      | 1.75      | 22               | 585                       | 18               | 475                       | 12               | 320                       |
|                                                                                  |                                        | M16 | 16.0      | 2.00      | 22               | 440                       | 18               | 360                       | 12               | 240                       |
|                                                                                  |                                        | M20 | 20.0      | 2.50      | 22               | 350                       | 18               | 285                       | 12               | 190                       |
|                                                                                  | Aciers<br>850 - 1100 N/mm <sup>2</sup> | M 3 | 3.0       | 0.50      | 18               | 1910                      | 12               | 1275                      | 10               | 1060                      |
|                                                                                  |                                        | M 4 | 4.0       | 0.70      | 18               | 1430                      | 12               | 955                       | 10               | 795                       |
|                                                                                  |                                        | M 5 | 5.0       | 0.80      | 18               | 1145                      | 12               | 765                       | 10               | 635                       |
|                                                                                  |                                        | M 6 | 6.0       | 1.00      | 18               | 955                       | 12               | 635                       | 10               | 530                       |
|                                                                                  |                                        | M 8 | 8.0       | 1.25      | 18               | 715                       | 12               | 475                       | 10               | 400                       |
|                                                                                  |                                        | M10 | 10.0      | 1.50      | 18               | 575                       | 12               | 380                       | 10               | 320                       |
|                                                                                  |                                        | M12 | 12.0      | 1.75      | 18               | 475                       | 12               | 320                       | 10               | 265                       |
|                                                                                  |                                        | M16 | 16.0      | 2.00      | 18               | 360                       | 12               | 240                       | 10               | 200                       |
|                                                                                  |                                        | M20 | 20.0      | 2.50      | 18               | 285                       | 12               | 190                       | 10               | 160                       |
|                                                                                  | Fonte<br>GG(G)                         | M 3 | 3.0       | 0.50      | 22               | 2335                      | 20               | 2120                      | 18               | 1910                      |
|                                                                                  |                                        | M 4 | 4.0       | 0.70      | 22               | 1750                      | 20               | 1590                      | 18               | 1430                      |
|                                                                                  |                                        | M 5 | 5.0       | 0.80      | 22               | 1400                      | 20               | 1275                      | 18               | 1145                      |
|                                                                                  |                                        | M 6 | 6.0       | 1.00      | 22               | 1165                      | 20               | 1060                      | 18               | 955                       |
|                                                                                  |                                        | M 8 | 8.0       | 1.25      | 22               | 875                       | 20               | 795                       | 18               | 715                       |
|                                                                                  |                                        | M10 | 10.0      | 1.50      | 22               | 700                       | 20               | 635                       | 18               | 575                       |
|                                                                                  |                                        | M12 | 12.0      | 1.75      | 22               | 585                       | 20               | 530                       | 18               | 475                       |
|                                                                                  |                                        | M16 | 16.0      | 2.00      | 22               | 440                       | 20               | 400                       | 18               | 360                       |
|                                                                                  |                                        | M20 | 20.0      | 2.50      | 22               | 350                       | 20               | 320                       | 18               | 285                       |

| Matières                                                                                                                    |     |           |           |                  |                           |                  |                           |                  |                           |
|-----------------------------------------------------------------------------------------------------------------------------|-----|-----------|-----------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
| Aciers inoxydables<br>[Cr-Ni/1.4301]<br> | M   | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $V_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] |
|                                                                                                                             | M 3 | 3.0       | 0.50      | 6                | 635                       | 4                | 425                       | 3                | 320                       |
|                                                                                                                             | M 4 | 4.0       | 0.70      | 6                | 475                       | 4                | 320                       | 3                | 240                       |
|                                                                                                                             | M 5 | 5.0       | 0.80      | 6                | 380                       | 4                | 255                       | 3                | 190                       |
|                                                                                                                             | M 6 | 6.0       | 1.00      | 6                | 320                       | 4                | 210                       | 3                | 160                       |
|                                                                                                                             | M 8 | 8.0       | 1.25      | 6                | 240                       | 4                | 160                       | 3                | 120                       |
|                                                                                                                             | M10 | 10.0      | 1.50      | 6                | 190                       | 4                | 125                       | 3                | 95                        |
|                                                                                                                             | M12 | 12.0      | 1.75      | 6                | 160                       | 4                | 105                       | 3                | 80                        |
|                                                                                                                             | M16 | 16.0      | 2.00      | 6                | 120                       | 4                | 80                        | 3                | 60                        |
|                                                                                                                             | M20 | 20.0      | 2.50      | 6                | 95                        | 4                | 65                        | 3                | 50                        |
| Aluminium corroyé<br>Si < 6%<br>trempé                                                                                      | M 3 | 3.0       | 0.50      | 18               | 1910                      | 15               | 1590                      | 12               | 1275                      |
|                                                                                                                             | M 4 | 4.0       | 0.70      | 18               | 1430                      | 15               | 1195                      | 12               | 955                       |
|                                                                                                                             | M 5 | 5.0       | 0.80      | 18               | 1145                      | 15               | 955                       | 12               | 765                       |
|                                                                                                                             | M 6 | 6.0       | 1.00      | 18               | 955                       | 15               | 795                       | 12               | 635                       |
|                                                                                                                             | M 8 | 8.0       | 1.25      | 18               | 715                       | 15               | 595                       | 12               | 475                       |
|                                                                                                                             | M10 | 10.0      | 1.50      | 18               | 575                       | 15               | 475                       | 12               | 380                       |
|                                                                                                                             | M12 | 12.0      | 1.75      | 18               | 475                       | 15               | 400                       | 12               | 320                       |
|                                                                                                                             | M16 | 16.0      | 2.00      | 18               | 360                       | 15               | 300                       | 12               | 240                       |
|                                                                                                                             | M20 | 20.0      | 2.50      | 18               | 285                       | 15               | 240                       | 12               | 190                       |
|                                                                                                                             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                                                             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                                                             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                                                             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                                                             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                                                             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                                                             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                                                             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                                                             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                                                             |     |           |           |                  |                           |                  |                           |                  |                           |
|                                                                                                                             |     |           |           |                  |                           |                  |                           |                  |                           |

**Form B**

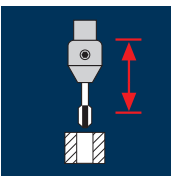


M

GG(G)  
Aluminium

[www.fraisa.com](http://www.fraisa.com)

## Application



## Matières

**Aciers**  
**< 500 N/mm<sup>2</sup>**

**Aciers**  
500 - 850 N/mm<sup>2</sup>

Aciers  
850 - 1100 N/mm<sup>2</sup>

Fonte  
GG(G)

| M   | ø<br>[mm] | P<br>[mm] | V <sub>C</sub><br>1.5 x d | n<br>[min <sup>-1</sup> ] | V <sub>C</sub><br>2.0 x d | n<br>[min <sup>-1</sup> ] | V <sub>C</sub><br>3.0 x d | n<br>[min <sup>-1</sup> ] |
|-----|-----------|-----------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| M 6 | 6.0       | 1.00      | 25                        | 1325                      | 20                        | 1060                      | 15                        | 795                       |
| M 8 | 8.0       | 1.25      | 25                        | 995                       | 20                        | 795                       | 15                        | 595                       |
| M10 | 10.0      | 1.50      | 25                        | 795                       | 20                        | 635                       | 15                        | 475                       |
| M12 | 12.0      | 1.75      | 25                        | 665                       | 20                        | 530                       | 15                        | 400                       |
| M14 | 14.0      | 2.00      | 25                        | 570                       | 20                        | 455                       | 15                        | 340                       |
| M16 | 16.0      | 2.00      | 25                        | 495                       | 20                        | 400                       | 15                        | 300                       |
| M18 | 18.0      | 2.50      | 25                        | 440                       | 20                        | 355                       | 15                        | 265                       |
| M20 | 20.0      | 2.50      | 25                        | 400                       | 20                        | 320                       | 15                        | 240                       |

|     |      |      |    |      |    |     |    |     |
|-----|------|------|----|------|----|-----|----|-----|
| M 6 | 6.0  | 1.00 | 22 | 1165 | 18 | 955 | 12 | 635 |
| M 8 | 8.0  | 1.25 | 22 | 875  | 18 | 715 | 12 | 475 |
| M10 | 10.0 | 1.50 | 22 | 700  | 18 | 575 | 12 | 380 |
| M12 | 12.0 | 1.75 | 22 | 585  | 18 | 475 | 12 | 320 |
| M14 | 14.0 | 2.00 | 22 | 500  | 18 | 410 | 12 | 275 |
| M16 | 16.0 | 2.00 | 22 | 440  | 18 | 360 | 12 | 240 |
| M18 | 18.0 | 2.50 | 22 | 390  | 18 | 320 | 12 | 210 |
| M20 | 20.0 | 2.50 | 22 | 350  | 18 | 285 | 12 | 190 |

|     |      |      |    |     |    |     |    |     |
|-----|------|------|----|-----|----|-----|----|-----|
| M 6 | 6.0  | 1.00 | 18 | 955 | 12 | 635 | 10 | 530 |
| M 8 | 8.0  | 1.25 | 18 | 715 | 12 | 475 | 10 | 400 |
| M10 | 10.0 | 1.50 | 18 | 575 | 12 | 380 | 10 | 320 |
| M12 | 12.0 | 1.75 | 18 | 475 | 12 | 320 | 10 | 265 |
| M14 | 14.0 | 2.00 | 18 | 410 | 12 | 275 | 10 | 225 |
| M16 | 16.0 | 2.00 | 18 | 360 | 12 | 240 | 10 | 200 |
| M18 | 18.0 | 2.50 | 18 | 320 | 12 | 210 | 10 | 175 |
| M20 | 20.0 | 2.50 | 18 | 285 | 12 | 190 | 10 | 160 |

|     |      |      |    |      |    |      |    |     |
|-----|------|------|----|------|----|------|----|-----|
| M 6 | 6.0  | 1.00 | 22 | 1165 | 20 | 1060 | 18 | 955 |
| M 8 | 8.0  | 1.25 | 22 | 875  | 20 | 795  | 18 | 715 |
| M10 | 10.0 | 1.50 | 22 | 700  | 20 | 635  | 18 | 575 |
| M12 | 12.0 | 1.75 | 22 | 585  | 20 | 530  | 18 | 475 |
| M14 | 14.0 | 2.00 | 22 | 500  | 20 | 455  | 18 | 410 |
| M16 | 16.0 | 2.00 | 22 | 440  | 20 | 400  | 18 | 360 |
| M18 | 18.0 | 2.50 | 22 | 390  | 20 | 355  | 18 | 320 |
| M20 | 20.0 | 2.50 | 22 | 350  | 20 | 320  | 18 | 285 |

## Matières

**Aciers inoxydables  
[Cr-Ni/1.4301]**



Aluminium corroyé  
Si < 6%  
trempé

| M   | ø<br>[mm] | P<br>[mm] | v <sub>C</sub><br>1.5 x d<br>[min <sup>-1</sup> ] | n   | v <sub>C</sub><br>2.0 x d<br>[min <sup>-1</sup> ] | n   | v <sub>C</sub><br>3.0 x d<br>[min <sup>-1</sup> ] | n   |
|-----|-----------|-----------|---------------------------------------------------|-----|---------------------------------------------------|-----|---------------------------------------------------|-----|
| M 6 | 6.0       | 1.00      | 6                                                 | 320 | 4                                                 | 210 | 3                                                 | 160 |
| M 8 | 8.0       | 1.25      | 6                                                 | 240 | 4                                                 | 160 | 3                                                 | 120 |
| M10 | 10.0      | 1.50      | 6                                                 | 190 | 4                                                 | 125 | 3                                                 | 95  |
| M12 | 12.0      | 1.75      | 6                                                 | 160 | 4                                                 | 105 | 3                                                 | 80  |
| M14 | 14.0      | 2.00      | 6                                                 | 135 | 4                                                 | 90  | 3                                                 | 70  |
| M16 | 16.0      | 2.00      | 6                                                 | 120 | 4                                                 | 80  | 3                                                 | 60  |
| M18 | 18.0      | 2.50      | 6                                                 | 105 | 4                                                 | 70  | 3                                                 | 55  |
| M20 | 20.0      | 2.50      | 6                                                 | 95  | 4                                                 | 65  | 3                                                 | 50  |

|     |      |      |    |     |    |     |    |     |
|-----|------|------|----|-----|----|-----|----|-----|
| M 6 | 6.0  | 1.00 | 18 | 955 | 15 | 795 | 12 | 635 |
| M 8 | 8.0  | 1.25 | 18 | 715 | 15 | 595 | 12 | 475 |
| M10 | 10.0 | 1.50 | 18 | 575 | 15 | 475 | 12 | 380 |
| M12 | 12.0 | 1.75 | 18 | 475 | 15 | 400 | 12 | 320 |
| M14 | 14.0 | 2.00 | 18 | 410 | 15 | 340 | 12 | 275 |
| M16 | 16.0 | 2.00 | 18 | 360 | 15 | 300 | 12 | 240 |
| M18 | 18.0 | 2.50 | 18 | 320 | 15 | 265 | 12 | 210 |
| M20 | 20.0 | 2.50 | 18 | 285 | 15 | 240 | 12 | 190 |

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Incool



M

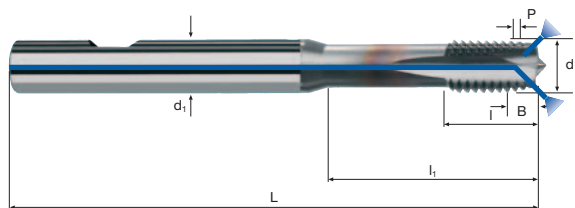
**ISO 2  
(6H)**



**HSS  
PM/F**



Form B



M

Rm

< 850

**Rm**

850-1100

## Inox

## Stainless

GG(G)

## Aluminium

[www.fraisa.com](http://www.fraisa.com)

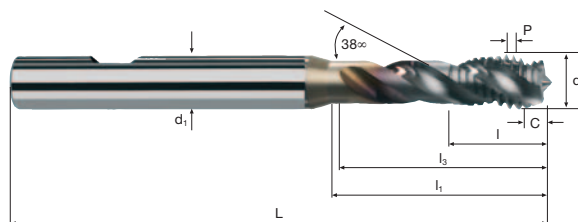
| Application                                                                       | Matières                   | M   | ø<br>[mm]                 | P<br>[mm] | V <sub>c</sub><br>1.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | V <sub>c</sub><br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | V <sub>c</sub><br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] |
|-----------------------------------------------------------------------------------|----------------------------|-----|---------------------------|-----------|---------------------------------------------------|---------------------------|---------------------------------------------------|---------------------------|---------------------------------------------------|---------------------------|
|  | Aciers<br>< 500 N/mm²      | M 3 | 3.0                       | 0.50      | 25                                                | 2655                      | 22                                                | 2335                      | 15                                                | 1590                      |
|                                                                                   |                            | M 4 | 4.0                       | 0.70      | 25                                                | 1990                      | 22                                                | 1750                      | 15                                                | 1195                      |
|                                                                                   |                            | M 5 | 5.0                       | 0.80      | 25                                                | 1590                      | 22                                                | 1400                      | 15                                                | 955                       |
|                                                                                   |                            | M 6 | 6.0                       | 1.00      | 25                                                | 1325                      | 22                                                | 1165                      | 15                                                | 795                       |
|                                                                                   |                            | M 8 | 8.0                       | 1.25      | 25                                                | 995                       | 22                                                | 875                       | 15                                                | 595                       |
|                                                                                   |                            | M10 | 10.0                      | 1.50      | 25                                                | 795                       | 22                                                | 700                       | 15                                                | 475                       |
|                                                                                   |                            | M12 | 12.0                      | 1.75      | 25                                                | 665                       | 22                                                | 585                       | 15                                                | 400                       |
|                                                                                   |                            | M16 | 16.0                      | 2.00      | 25                                                | 495                       | 22                                                | 440                       | 15                                                | 300                       |
|                                                                                   |                            | M20 | 20.0                      | 2.50      | 25                                                | 400                       | 22                                                | 350                       | 15                                                | 240                       |
|                                                                                   |                            |     | Aciers<br>500 - 850 N/mm² | M 3       | 3.0                                               | 0.50                      | 22                                                | 2335                      | 20                                                | 2120                      |
| M 4                                                                               | 4.0                        |     |                           | 0.70      | 22                                                | 1750                      | 20                                                | 1590                      | 12                                                | 955                       |
| M 5                                                                               | 5.0                        |     |                           | 0.80      | 22                                                | 1400                      | 20                                                | 1275                      | 12                                                | 765                       |
| M 6                                                                               | 6.0                        |     |                           | 1.00      | 22                                                | 1165                      | 20                                                | 1060                      | 12                                                | 635                       |
| M 8                                                                               | 8.0                        |     |                           | 1.25      | 22                                                | 875                       | 20                                                | 795                       | 12                                                | 475                       |
| M10                                                                               | 10.0                       |     |                           | 1.50      | 22                                                | 700                       | 20                                                | 635                       | 12                                                | 380                       |
| M12                                                                               | 12.0                       |     |                           | 1.75      | 22                                                | 585                       | 20                                                | 530                       | 12                                                | 320                       |
| M16                                                                               | 16.0                       |     |                           | 2.00      | 22                                                | 440                       | 20                                                | 400                       | 12                                                | 240                       |
| M20                                                                               | 20.0                       |     |                           | 2.50      | 22                                                | 350                       | 20                                                | 320                       | 12                                                | 190                       |
|                                                                                   | Aciers<br>850 - 1100 N/mm² |     |                           | M 3       | 3.0                                               | 0.50                      | 18                                                | 1910                      | 12                                                | 1275                      |
|                                                                                   |                            | M 4 | 4.0                       | 0.70      | 18                                                | 1430                      | 12                                                | 955                       | 8                                                 | 635                       |
|                                                                                   |                            | M 5 | 5.0                       | 0.80      | 18                                                | 1145                      | 12                                                | 765                       | 8                                                 | 510                       |
|                                                                                   |                            | M 6 | 6.0                       | 1.00      | 18                                                | 955                       | 12                                                | 635                       | 8                                                 | 425                       |
|                                                                                   |                            | M 8 | 8.0                       | 1.25      | 18                                                | 715                       | 12                                                | 475                       | 8                                                 | 320                       |
|                                                                                   |                            | M10 | 10.0                      | 1.50      | 18                                                | 575                       | 12                                                | 380                       | 8                                                 | 255                       |
|                                                                                   |                            | M12 | 12.0                      | 1.75      | 18                                                | 475                       | 12                                                | 320                       | 8                                                 | 210                       |
|                                                                                   |                            | M16 | 16.0                      | 2.00      | 18                                                | 360                       | 12                                                | 240                       | 8                                                 | 160                       |
|                                                                                   |                            | M20 | 20.0                      | 2.50      | 18                                                | 285                       | 12                                                | 190                       | 8                                                 | 125                       |
|                                                                                   |                            |     | Fonte<br>GG(G)            | M 3       | 3.0                                               | 0.50                      | 18                                                | 1910                      | 15                                                | 1590                      |
| M 4                                                                               | 4.0                        |     |                           | 0.70      | 18                                                | 1430                      | 15                                                | 1195                      | 12                                                | 955                       |
| M 5                                                                               | 5.0                        |     |                           | 0.80      | 18                                                | 1145                      | 15                                                | 955                       | 12                                                | 765                       |
| M 6                                                                               | 6.0                        |     |                           | 1.00      | 18                                                | 955                       | 15                                                | 795                       | 12                                                | 635                       |
| M 8                                                                               | 8.0                        |     |                           | 1.25      | 18                                                | 715                       | 15                                                | 595                       | 12                                                | 475                       |
| M10                                                                               | 10.0                       |     |                           | 1.50      | 18                                                | 575                       | 15                                                | 475                       | 12                                                | 380                       |
| M12                                                                               | 12.0                       |     |                           | 1.75      | 18                                                | 475                       | 15                                                | 400                       | 12                                                | 320                       |
| M16                                                                               | 16.0                       |     |                           | 2.00      | 18                                                | 360                       | 15                                                | 300                       | 12                                                | 240                       |
| M20                                                                               | 20.0                       |     |                           | 2.50      | 18                                                | 285                       | 15                                                | 240                       | 12                                                | 190                       |

| Matières                             | M                                      | ø<br>[mm] | P<br>[mm] | V <sub>c</sub><br>1.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | V <sub>c</sub><br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | V <sub>c</sub><br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] |
|--------------------------------------|----------------------------------------|-----------|-----------|---------------------------------------------------|---------------------------|---------------------------------------------------|---------------------------|---------------------------------------------------|---------------------------|
| Aciers inoxydables<br>[Cr-Ni/1.4301] | M 3                                    | 3.0       | 0.50      | 4                                                 | 425                       | 3                                                 | 320                       | 2                                                 | 210                       |
|                                      | M 4                                    | 4.0       | 0.70      | 4                                                 | 320                       | 3                                                 | 240                       | 2                                                 | 160                       |
|                                      | M 5                                    | 5.0       | 0.80      | 4                                                 | 255                       | 3                                                 | 190                       | 2                                                 | 125                       |
|                                      | M 6                                    | 6.0       | 1.00      | 4                                                 | 210                       | 3                                                 | 160                       | 2                                                 | 105                       |
|                                      | M 8                                    | 8.0       | 1.25      | 4                                                 | 160                       | 3                                                 | 120                       | 2                                                 | 80                        |
|                                      | M10                                    | 10.0      | 1.50      | 4                                                 | 125                       | 3                                                 | 95                        | 2                                                 | 65                        |
|                                      | M12                                    | 12.0      | 1.75      | 4                                                 | 105                       | 3                                                 | 80                        | 2                                                 | 55                        |
|                                      | M16                                    | 16.0      | 2.00      | 4                                                 | 80                        | 3                                                 | 60                        | 2                                                 | 40                        |
|                                      | M20                                    | 20.0      | 2.50      | 4                                                 | 65                        | 3                                                 | 50                        | 2                                                 | 30                        |
|                                      | Aluminium corroyé<br>Si < 6%<br>trempé | M 3       | 3.0       | 0.50                                              | 12                        | 1275                                              | 10                        | 1060                                              | 8                         |
| M 4                                  |                                        | 4.0       | 0.70      | 12                                                | 955                       | 10                                                | 795                       | 8                                                 | 635                       |
| M 5                                  |                                        | 5.0       | 0.80      | 12                                                | 765                       | 10                                                | 635                       | 8                                                 | 510                       |
| M 6                                  |                                        | 6.0       | 1.00      | 12                                                | 635                       | 10                                                | 530                       | 8                                                 | 425                       |
| M 8                                  |                                        | 8.0       | 1.25      | 12                                                | 475                       | 10                                                | 400                       | 8                                                 | 320                       |
| M10                                  |                                        | 10.0      | 1.50      | 12                                                | 380                       | 10                                                | 320                       | 8                                                 | 255                       |
| M12                                  |                                        | 12.0      | 1.75      | 12                                                | 320                       | 10                                                | 265                       | 8                                                 | 210                       |
| M16                                  |                                        | 16.0      | 2.00      | 12                                                | 240                       | 10                                                | 200                       | 8                                                 | 160                       |
| M20                                  |                                        | 20.0      | 2.50      | 12                                                | 190                       | 10                                                | 160                       | 8                                                 | 125                       |
|                                      |                                        |           |           |                                                   |                           |                                                   |                           |                                                   |                           |
|                                      |                                        |           |           |                                                   |                           |                                                   |                           |                                                   |                           |
|                                      |                                        |           |           |                                                   |                           |                                                   |                           |                                                   |                           |
|                                      |                                        |           |           |                                                   |                           |                                                   |                           |                                                   |                           |
|                                      |                                        |           |           |                                                   |                           |                                                   |                           |                                                   |                           |
|                                      |                                        |           |           |                                                   |                           |                                                   |                           |                                                   |                           |
|                                      |                                        |           |           |                                                   |                           |                                                   |                           |                                                   |                           |
|                                      |                                        |           |           |                                                   |                           |                                                   |                           |                                                   |                           |
|                                      |                                        |           |           |                                                   |                           |                                                   |                           |                                                   |                           |
|                                      |                                        |           |           |                                                   |                           |                                                   |                           |                                                   |                           |

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**Form C**



M

GG(G)  
Aluminium207



Incool



M

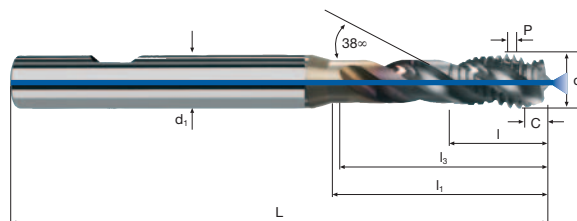
**ISO 2  
(6H)**



**HSS  
PM/F**



Form C



M

**Rm**  
**< 850**

**Rm**  
850-1100

**Inox**  
Stainless

GG(G)  
Aluminium[illegible]



Tarauds u-tap

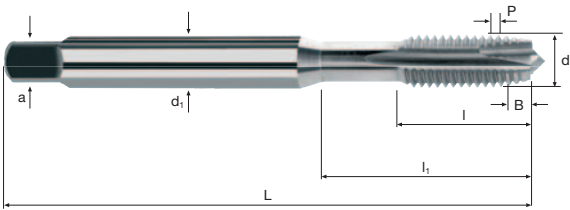


M

ISO 2  
(6H)

HSS-E  
Co5

Form B



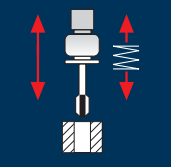
M

Rm  
< 850

Inox  
Stainless

GG(G)  
Aluminium  
Copper

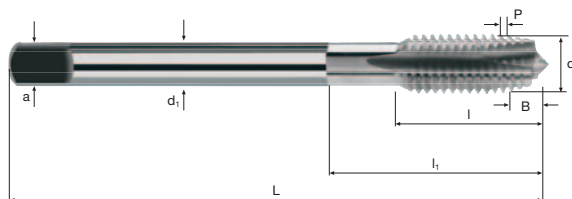
| Exemple: N° cde<br>N° d'article<br>Code-ø<br><b>E10800 .010</b> |       |      |     |      |      |      |     |   |        |        | VAP     |
|-----------------------------------------------------------------|-------|------|-----|------|------|------|-----|---|--------|--------|---------|
|                                                                 |       |      |     |      |      |      |     |   |        | E10800 | EV10800 |
| Ø<br>Code                                                       | d     | P    | L   | l    | l1   | d1   | a   |   |        |        |         |
| .010                                                            | M 1   | 0.25 | 40  | 5.5  | —    | 2.5  | 2.1 | 2 | 0.80 * | ●      | ●       |
| .012                                                            | M 1.2 | 0.25 | 40  | 5.5  | —    | 2.5  | 2.1 | 2 | 1.00   | ●      | ●       |
| .020                                                            | M 1.4 | 0.30 | 40  | 7.0  | —    | 2.5  | 2.1 | 2 | 1.15 * | ●      | ●       |
| .022                                                            | M 1.6 | 0.35 | 40  | 8.0  | —    | 2.5  | 2.1 | 2 | 1.30   | ●      | ●       |
| .024                                                            | M 1.7 | 0.35 | 40  | 8.0  | —    | 2.5  | 2.1 | 2 | 1.40   | ●      | ●       |
| .026                                                            | M 1.8 | 0.35 | 40  | 8.0  | —    | 2.5  | 2.1 | 2 | 1.50   | ●      | ●       |
| .034                                                            | M 2   | 0.40 | 45  | 8.0  | —    | 2.8  | 2.1 | 2 | 1.60   | ●      | ●       |
| .036                                                            | M 2.2 | 0.45 | 45  | 9.0  | —    | 2.8  | 2.1 | 2 | 1.75   | ●      | ●       |
| .038                                                            | M 2.3 | 0.40 | 45  | 9.0  | —    | 2.8  | 2.1 | 2 | 1.90   | ●      | ●       |
| .040                                                            | M 2.5 | 0.45 | 50  | 9.0  | —    | 2.8  | 2.1 | 2 | 2.05   | ●      | ●       |
| .042                                                            | M 2.6 | 0.45 | 50  | 9.0  | —    | 2.8  | 2.1 | 2 | 2.15   | ●      | ●       |
| .044                                                            | M 3   | 0.50 | 56  | 12.0 | 18.0 | 3.5  | 2.7 | 3 | 2.50   | ●      | ●       |
| .056                                                            | M 3.5 | 0.60 | 56  | 12.0 | 20.0 | 4.0  | 3.0 | 3 | 2.90   | ●      | ●       |
| .058                                                            | M 4   | 0.70 | 63  | 13.0 | 21.0 | 4.5  | 3.4 | 3 | 3.30   | ●      | ●       |
| .061                                                            | M 4.5 | 0.75 | 70  | 14.0 | 25.0 | 6.0  | 4.9 | 3 | 3.75   | ●      | ●       |
| .084                                                            | M 5   | 0.80 | 70  | 15.0 | 25.0 | 6.0  | 4.9 | 3 | 4.20   | ●      | ●       |
| .088                                                            | M 6   | 1.00 | 80  | 17.0 | 30.0 | 6.0  | 4.9 | 3 | 5.00   | ●      | ●       |
| .089                                                            | M 7   | 1.00 | 80  | 17.0 | 30.0 | 7.0  | 6.2 | 3 | 6.00   | ●      | ●       |
| .160                                                            | M 8   | 1.25 | 90  | 20.0 | 35.0 | 8.0  | 6.2 | 3 | 6.80   | ●      | ●       |
| .174                                                            | M10   | 1.50 | 100 | 22.0 | 39.0 | 10.0 | 8.0 | 3 | 8.50   | ●      | ●       |
| ≤ M1.4 Tolérance ISO 1 (4H)                                     |       |      |     |      |      |      |     |   |        |        |         |
| * La dimension donnée est hors norme                            |       |      |     |      |      |      |     |   |        |        |         |
| Dimensions plus grandes voir N° d'article E10801, page 213      |       |      |     |      |      |      |     |   |        |        |         |

| Application                                                                       | Matières                               | M   | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>3.0 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-----------------------------------------------------------------------------------|----------------------------------------|-----|-----------|-----------|-----------------------------|---------------------------|-----------------|-----------------------------|---------------------------|-----------------|-----------------------------|---------------------------|-----------------|
|   | Aciers<br>< 500 N/mm <sup>2</sup>      | M12 | 12.0      | 1.75      | 18                          | 475                       | 831             | 15                          | 400                       | 700             | 12                          | 320                       | 560             |
|                                                                                   |                                        | M14 | 14.0      | 2.00      | 18                          | 410                       | 820             | 15                          | 340                       | 680             | 12                          | 275                       | 550             |
|                                                                                   |                                        | M16 | 16.0      | 2.00      | 18                          | 360                       | 720             | 15                          | 300                       | 600             | 12                          | 240                       | 480             |
|                                                                                   |                                        | M18 | 18.0      | 2.50      | 18                          | 320                       | 800             | 15                          | 265                       | 663             | 12                          | 210                       | 525             |
|                                                                                   |                                        | M20 | 20.0      | 2.50      | 18                          | 285                       | 713             | 15                          | 240                       | 600             | 12                          | 190                       | 475             |
|                                                                                   |                                        | M22 | 22.0      | 2.50      | 18                          | 260                       | 650             | 15                          | 215                       | 538             | 12                          | 175                       | 438             |
|                                                                                   |                                        | M24 | 24.0      | 3.00      | 18                          | 240                       | 720             | 15                          | 200                       | 600             | 12                          | 160                       | 480             |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                   | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M12 | 12.0      | 1.75      | 15                          | 400                       | 700             | 10                          | 265                       | 464             | 8                           | 210                       | 368             |
|                                                                                   |                                        | M14 | 14.0      | 2.00      | 15                          | 340                       | 680             | 10                          | 225                       | 450             | 8                           | 180                       | 360             |
|                                                                                   |                                        | M16 | 16.0      | 2.00      | 15                          | 300                       | 600             | 10                          | 200                       | 400             | 8                           | 160                       | 320             |
|                                                                                   |                                        | M18 | 18.0      | 2.50      | 15                          | 265                       | 663             | 10                          | 175                       | 438             | 8                           | 140                       | 350             |
|                                                                                   |                                        | M20 | 20.0      | 2.50      | 15                          | 240                       | 600             | 10                          | 160                       | 400             | 8                           | 125                       | 313             |
|                                                                                   |                                        | M22 | 22.0      | 2.50      | 15                          | 215                       | 538             | 10                          | 145                       | 363             | 8                           | 115                       | 288             |
|                                                                                   |                                        | M24 | 24.0      | 3.00      | 15                          | 200                       | 600             | 10                          | 135                       | 405             | 8                           | 105                       | 315             |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                   | Aluminium corroyé<br>Si < 6%<br>trempé | M12 | 12.0      | 1.75      | 15                          | 400                       | 700             | 12                          | 320                       | 560             | 10                          | 265                       | 464             |
|                                                                                   |                                        | M14 | 14.0      | 2.00      | 15                          | 340                       | 680             | 12                          | 275                       | 550             | 10                          | 225                       | 450             |
|                                                                                   |                                        | M16 | 16.0      | 2.00      | 15                          | 300                       | 600             | 12                          | 240                       | 480             | 10                          | 200                       | 400             |
|                                                                                   |                                        | M18 | 18.0      | 2.50      | 15                          | 265                       | 663             | 12                          | 210                       | 525             | 10                          | 175                       | 438             |
|                                                                                   |                                        | M20 | 20.0      | 2.50      | 15                          | 240                       | 600             | 12                          | 190                       | 475             | 10                          | 160                       | 400             |
|                                                                                   | Recommandation:<br>sans revêtement     | M22 | 22.0      | 2.50      | 15                          | 215                       | 538             | 12                          | 175                       | 438             | 10                          | 145                       | 363             |
|                                                                                   |                                        | M24 | 24.0      | 3.00      | 15                          | 200                       | 600             | 12                          | 160                       | 480             | 10                          | 135                       | 405             |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                   | Aciers inoxydables<br>[Cr-Ni/1.4301]   | M12 | 2.6       | 0.45      | 5                           | 610                       | 275             | 4                           | 490                       | 221             | 3                           | 365                       | 164             |
|                                                                                   |                                        | M14 | 3.0       | 0.50      | 5                           | 530                       | 265             | 4                           | 425                       | 213             | 3                           | 320                       | 160             |
|                                                                                   |                                        | M16 | 3.5       | 0.60      | 5                           | 455                       | 273             | 4                           | 365                       | 219             | 3                           | 275                       | 165             |
|                                                                                   |                                        | M18 | 4.0       | 0.70      | 5                           | 400                       | 280             | 4                           | 320                       | 224             | 3                           | 240                       | 168             |
|                                                                                   |                                        | M20 | 4.5       | 0.75      | 5                           | 355                       | 266             | 4                           | 285                       | 214             | 3                           | 210                       | 158             |
|  |                                        | M22 | 5.0       | 0.80      | 5                           | 320                       | 256             | 4                           | 255                       | 204             | 3                           | 190                       | 152             |
|                                                                                   |                                        | M24 | 6.0       | 1.00      | 5                           | 265                       | 265             | 4                           | 210                       | 210             | 3                           | 160                       | 160             |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |
|                                                                                   |                                        |     |           |           |                             |                           |                 |                             |                           |                 |                             |                           |                 |





**ISO 2**  
**(6H)**



M

**Inox**  
Stainless

GG(G)  
Aluminium  
Copper[illegible]



Tarauds u-tap

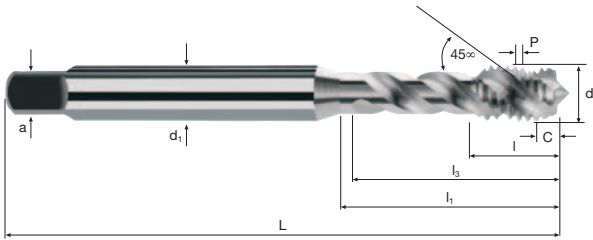


M

ISO 2  
(6H)

HSS-E  
Co5

X - P  
Form C



M

Rm  
< 850

Inox  
Stainless

GG(G)  
Aluminium  
Copper

| Exemple:<br>N° cde                                         |       |      |     |      |      |      |      |     |   |      |        | VAP     |
|------------------------------------------------------------|-------|------|-----|------|------|------|------|-----|---|------|--------|---------|
|                                                            |       |      |     |      |      |      |      |     |   |      | E10820 | EV10820 |
| Ø<br>Code                                                  | d     | P    | L   | l    | l1   | l3   | d1   | a   |   |      |        |         |
| .022                                                       | M 1.6 | 0.35 | 40  | 8.0  | —    | 9.0  | 2.5  | 2.1 | 3 | 1.30 | ●      | ●       |
| .024                                                       | M 1.7 | 0.35 | 40  | 8.0  | —    | 9.0  | 2.5  | 2.1 | 3 | 1.40 | ●      | ●       |
| .026                                                       | M 1.8 | 0.35 | 40  | 8.0  | —    | 9.0  | 2.5  | 2.1 | 3 | 1.50 | ●      | ●       |
| .034                                                       | M 2   | 0.40 | 45  | 8.0  | —    | 10.5 | 2.8  | 2.1 | 3 | 1.60 | ●      | ●       |
| .036                                                       | M 2.2 | 0.45 | 45  | 9.0  | —    | 12.5 | 2.8  | 2.1 | 3 | 1.75 | ●      | ●       |
| .038                                                       | M 2.3 | 0.40 | 45  | 9.0  | —    | 12.5 | 2.8  | 2.1 | 3 | 1.90 | ●      | ●       |
| .040                                                       | M 2.5 | 0.45 | 50  | 9.0  | —    | 13.0 | 2.8  | 2.1 | 3 | 2.05 | ●      | ●       |
| .042                                                       | M 2.6 | 0.45 | 50  | 9.0  | —    | 13.0 | 2.8  | 2.1 | 3 | 2.15 | ●      | ●       |
| .044                                                       | M 3   | 0.50 | 56  | 4.0  | 18.0 | 16.0 | 3.5  | 2.7 | 3 | 2.50 | ●      | ●       |
| .056                                                       | M 3.5 | 0.60 | 56  | 4.8  | 20.0 | 18.0 | 4.0  | 3.0 | 3 | 2.90 | ●      | ●       |
| .058                                                       | M 4   | 0.70 | 63  | 5.6  | 21.0 | 19.0 | 4.5  | 3.4 | 3 | 3.30 | ●      | ●       |
| .061                                                       | M 4.5 | 0.75 | 70  | 6.0  | 25.0 | 23.0 | 6.0  | 4.9 | 3 | 3.75 | ●      | ●       |
| .084                                                       | M 5   | 0.80 | 70  | 6.4  | 25.0 | 23.0 | 6.0  | 4.9 | 3 | 4.20 | ●      | ●       |
| .088                                                       | M 6   | 1.00 | 80  | 8.0  | 30.0 | 28.0 | 6.0  | 4.9 | 3 | 5.00 | ●      | ●       |
| .089                                                       | M 7   | 1.00 | 80  | 8.0  | 30.0 | 28.0 | 7.0  | 6.2 | 3 | 6.00 | ●      | ●       |
| .160                                                       | M 8   | 1.25 | 90  | 10.0 | 35.0 | 33.0 | 8.0  | 6.2 | 3 | 6.80 | ●      | ●       |
| .174                                                       | M10   | 1.50 | 100 | 12.0 | 39.0 | 37.0 | 10.0 | 8.0 | 3 | 8.50 | ●      | ●       |
|                                                            |       |      |     |      |      |      |      |     |   |      |        |         |
|                                                            |       |      |     |      |      |      |      |     |   |      |        |         |
|                                                            |       |      |     |      |      |      |      |     |   |      |        |         |
|                                                            |       |      |     |      |      |      |      |     |   |      |        |         |
|                                                            |       |      |     |      |      |      |      |     |   |      |        |         |
| Dimensions plus grandes voir N° d'article E10821, page 217 |       |      |     |      |      |      |      |     |   |      |        |         |



Tarauds u-tap

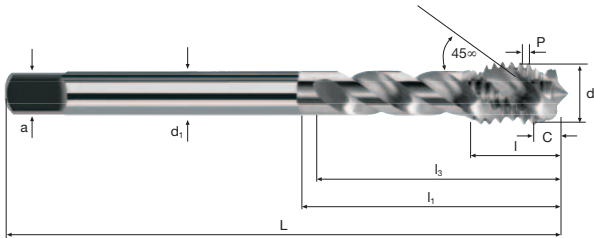


M

ISO 2  
(6H)

HSS-E  
Co5

Form C



M

Rm  
< 850

Inox  
Stainless

GG(G)  
Aluminium  
Copper

| Exemple: N° cde<br><div>N° d'article<br/>E10821</div> <div>Code-ø<br/>.240</div> |     |      |     |    |     |     |    |      |   |       |        | VAP     |
|----------------------------------------------------------------------------------|-----|------|-----|----|-----|-----|----|------|---|-------|--------|---------|
|                                                                                  |     |      |     |    |     |     |    |      |   |       | E10821 | EV10821 |
| Ø<br>Code                                                                        | d   | P    | L   | l  | l1  | l3  | d1 | a    |   |       |        |         |
| .240                                                                             | M12 | 1.75 | 110 | 14 | 50  | 48  | 9  | 7.0  | 3 | 10.20 | ●      | ●       |
| .244                                                                             | M14 | 2.00 | 110 | 16 | 58  | 56  | 11 | 9.0  | 4 | 12.00 | ●      | ●       |
| .246                                                                             | M16 | 2.00 | 110 | 16 | 58  | 56  | 12 | 9.0  | 4 | 14.00 | ●      | ●       |
| .312                                                                             | M18 | 2.50 | 125 | 20 | 65  | 63  | 14 | 11.0 | 4 | 15.50 | ●      | ●       |
| .314                                                                             | M20 | 2.50 | 140 | 20 | 72  | 70  | 16 | 12.0 | 4 | 17.50 | ●      | ●       |
| .316                                                                             | M22 | 2.50 | 140 | 20 | 72  | 70  | 18 | 14.5 | 4 | 19.50 | ●      | ●       |
| .320                                                                             | M24 | 3.00 | 160 | 24 | 74  | 72  | 18 | 14.5 | 4 | 21.00 | ●      | ●       |
| .322                                                                             | M27 | 3.00 | 160 | 30 | 84  | 82  | 20 | 16.0 | 4 | 24.00 | ●      | ●       |
| .374                                                                             | M30 | 3.50 | 180 | 35 | 92  | 90  | 22 | 18.0 | 4 | 26.50 | ●      | ●       |
| .376                                                                             | M33 | 3.50 | 180 | 35 | 100 | 98  | 25 | 20.0 | 4 | 29.50 | ●      | ●       |
| .378                                                                             | M36 | 4.00 | 200 | 40 | 101 | 99  | 28 | 22.0 | 4 | 32.00 | ●      | ●       |
| .380                                                                             | M39 | 4.00 | 200 | 40 | 101 | 99  | 32 | 24.0 | 4 | 35.00 | ●      | ●       |
| .382                                                                             | M42 | 4.50 | 200 | 45 | 106 | 104 | 32 | 24.0 | 4 | 37.50 | ●      | ●       |
|                                                                                  |     |      |     |    |     |     |    |      |   |       |        |         |
|                                                                                  |     |      |     |    |     |     |    |      |   |       |        |         |
|                                                                                  |     |      |     |    |     |     |    |      |   |       |        |         |
|                                                                                  |     |      |     |    |     |     |    |      |   |       |        |         |
|                                                                                  |     |      |     |    |     |     |    |      |   |       |        |         |
|                                                                                  |     |      |     |    |     |     |    |      |   |       |        |         |
|                                                                                  |     |      |     |    |     |     |    |      |   |       |        |         |
|                                                                                  |     |      |     |    |     |     |    |      |   |       |        |         |
|                                                                                  |     |      |     |    |     |     |    |      |   |       |        |         |
|                                                                                  |     |      |     |    |     |     |    |      |   |       |        |         |
|                                                                                  |     |      |     |    |     |     |    |      |   |       |        |         |

| Application | Matières                               | <table><tr><th>M</th><th>ø</th><th>P</th><th><math>v_c</math></th><th>n</th><th><math>v_f</math></th><th><math>v_c</math></th><th>n</th><th><math>v_f</math></th><th><math>v_c</math></th><th>n</th><th><math>v_f</math></th></tr><tr><th></th><th>[mm]</th><th>[mm]</th><th>1.5 x d</th><th>[min<sup>-1</sup>]</th><th>[100%]</th><th>2.0 x d</th><th>[min<sup>-1</sup>]</th><th>[100%]</th><th>3.0 x d</th><th>[min<sup>-1</sup>]</th><th>[100%]</th></tr></table> |         |                      |        |         |                      |        |         |                      |        |     |     | M | ø | P | $v_c$ | n | $v_f$ | $v_c$ | n | $v_f$ | $v_c$ | n | $v_f$ |  | [mm] | [mm] | 1.5 x d | [min <sup>-1</sup> ] | [100%] | 2.0 x d | [min <sup>-1</sup> ] | [100%] | 3.0 x d | [min <sup>-1</sup> ] | [100%] |
|-------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|-----|-----|---|---|---|-------|---|-------|-------|---|-------|-------|---|-------|--|------|------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|
| M           | ø                                      | P                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             | [mm]                                   | [mm]                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.5 x d | [min <sup>-1</sup> ] | [100%] | 2.0 x d | [min <sup>-1</sup> ] | [100%] | 3.0 x d | [min <sup>-1</sup> ] | [100%] |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             | Aciers<br>< 500 N/mm <sup>2</sup>      | M 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.0     | 0.50                 | 8      | 850     | 425                  | 6      | 635     | 318                  | 4      | 425 | 213 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.0     | 0.70                 | 8      | 635     | 445                  | 6      | 475     | 333                  | 4      | 320 | 224 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.0     | 0.80                 | 8      | 510     | 408                  | 6      | 380     | 304                  | 4      | 255 | 204 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6.0     | 1.00                 | 8      | 425     | 425                  | 6      | 320     | 320                  | 4      | 210 | 210 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8.0     | 1.25                 | 8      | 320     | 400                  | 6      | 240     | 300                  | 4      | 160 | 200 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M10                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10.0    | 1.50                 | 8      | 255     | 383                  | 6      | 190     | 285                  | 4      | 125 | 188 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.0     | 0.50                 | 5      | 530     | 265                  | 4      | 425     | 213                  | 3      | 320 | 160 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.0     | 0.70                 | 5      | 400     | 280                  | 4      | 320     | 224                  | 3      | 240 | 168 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.0     | 0.80                 | 5      | 320     | 256                  | 4      | 255     | 204                  | 3      | 190 | 152 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6.0     | 1.00                 | 5      | 265     | 265                  | 4      | 210     | 210                  | 3      | 160 | 160 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8.0     | 1.25                 | 5      | 200     | 250                  | 4      | 160     | 200                  | 3      | 120 | 150 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M10                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10.0    | 1.50                 | 5      | 160     | 240                  | 4      | 125     | 188                  | 3      | 95  | 143 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             | Aluminium corroyé<br>Si < 6%<br>trempé | M 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.0     | 0.50                 | 8      | 850     | 425                  | 6      | 635     | 318                  | 4      | 425 | 213 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.0     | 0.70                 | 8      | 635     | 445                  | 6      | 475     | 333                  | 4      | 320 | 224 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.0     | 0.80                 | 8      | 510     | 408                  | 6      | 380     | 304                  | 4      | 255 | 204 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6.0     | 1.00                 | 8      | 425     | 425                  | 6      | 320     | 320                  | 4      | 210 | 210 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8.0     | 1.25                 | 8      | 320     | 400                  | 6      | 240     | 300                  | 4      | 160 | 200 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M10                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10.0    | 1.50                 | 8      | 255     | 383                  | 6      | 190     | 285                  | 4      | 125 | 188 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             | Fonte<br>GG(G)                         | M 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.0     | 0.50                 | 12     | 1275    | 638                  | 10     | 1060    | 530                  | 8      | 850 | 425 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.0     | 0.70                 | 12     | 955     | 669                  | 10     | 795     | 557                  | 8      | 635 | 445 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.0     | 0.80                 | 12     | 765     | 612                  | 10     | 635     | 508                  | 8      | 510 | 408 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6.0     | 1.00                 | 12     | 635     | 635                  | 10     | 530     | 530                  | 8      | 425 | 425 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8.0     | 1.25                 | 12     | 475     | 594                  | 10     | 400     | 500                  | 8      | 320 | 400 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        | M10                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10.0    | 1.50                 | 12     | 380     | 570                  | 10     | 320     | 480                  | 8      | 255 | 383 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |

Extra longue



M

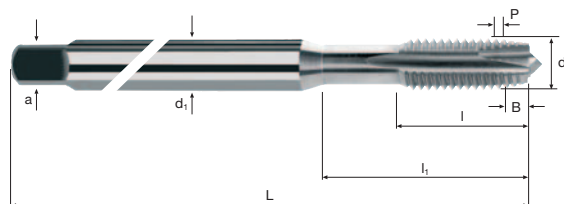
**ISO 2**  
**(6H)**



**HSS  
PM/F**



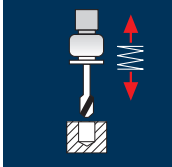
Form B



M

**Rm**  
**< 850**

GG(G)  
Aluminium[illegible]

| Application                                                                      | Matières                               | <table><tr><th>M</th><th>ø</th><th>P</th><th><math>v_c</math></th><th>n</th><th><math>v_f</math></th><th><math>v_c</math></th><th>n</th><th><math>v_f</math></th><th><math>v_c</math></th><th>n</th><th><math>v_f</math></th></tr><tr><th></th><th>[mm]</th><th>[mm]</th><th>1.0 x d</th><th>[min<sup>-1</sup>]</th><th>[100%]</th><th>1.5 x d</th><th>[min<sup>-1</sup>]</th><th>[100%]</th><th>2.0 x d</th><th>[min<sup>-1</sup>]</th><th>[100%]</th></tr></table> |         |                      |        |         |                      |        |         |                      |        |     |     | M | ø | P | $v_c$ | n | $v_f$ | $v_c$ | n | $v_f$ | $v_c$ | n | $v_f$ |  | [mm] | [mm] | 1.0 x d | [min <sup>-1</sup> ] | [100%] | 1.5 x d | [min <sup>-1</sup> ] | [100%] | 2.0 x d | [min <sup>-1</sup> ] | [100%] |
|----------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|-----|-----|---|---|---|-------|---|-------|-------|---|-------|-------|---|-------|--|------|------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|
| M                                                                                | ø                                      | P                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  | [mm]                                   | [mm]                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.0 x d | [min <sup>-1</sup> ] | [100%] | 1.5 x d | [min <sup>-1</sup> ] | [100%] | 2.0 x d | [min <sup>-1</sup> ] | [100%] |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|  | Aciers<br>< 500 N/mm <sup>2</sup>      | M 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.0     | 0.50                 | 8      | 850     | 425                  | 6      | 635     | 318                  | 4      | 425 | 213 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.0     | 0.70                 | 8      | 635     | 445                  | 6      | 475     | 333                  | 4      | 320 | 224 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.0     | 0.80                 | 8      | 510     | 408                  | 6      | 380     | 304                  | 4      | 255 | 204 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6.0     | 1.00                 | 8      | 425     | 425                  | 6      | 320     | 320                  | 4      | 210 | 210 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8.0     | 1.25                 | 8      | 320     | 400                  | 6      | 240     | 300                  | 4      | 160 | 200 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M10                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10.0    | 1.50                 | 8      | 255     | 383                  | 6      | 190     | 285                  | 4      | 125 | 188 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.0     | 0.50                 | 5      | 530     | 265                  | 4      | 425     | 213                  | 3      | 320 | 160 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.0     | 0.70                 | 5      | 400     | 280                  | 4      | 320     | 224                  | 3      | 240 | 168 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.0     | 0.80                 | 5      | 320     | 256                  | 4      | 255     | 204                  | 3      | 190 | 152 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6.0     | 1.00                 | 5      | 265     | 265                  | 4      | 210     | 210                  | 3      | 160 | 160 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8.0     | 1.25                 | 5      | 200     | 250                  | 4      | 160     | 200                  | 3      | 120 | 150 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M10                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10.0    | 1.50                 | 5      | 160     | 240                  | 4      | 125     | 188                  | 3      | 95  | 143 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  | Aluminium corroyé<br>Si < 6%<br>trempé | M 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.0     | 0.50                 | 8      | 850     | 425                  | 6      | 635     | 318                  | 4      | 425 | 213 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.0     | 0.70                 | 8      | 635     | 445                  | 6      | 475     | 333                  | 4      | 320 | 224 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.0     | 0.80                 | 8      | 510     | 408                  | 6      | 380     | 304                  | 4      | 255 | 204 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6.0     | 1.00                 | 8      | 425     | 425                  | 6      | 320     | 320                  | 4      | 210 | 210 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8.0     | 1.25                 | 8      | 320     | 400                  | 6      | 240     | 300                  | 4      | 160 | 200 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M10                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10.0    | 1.50                 | 8      | 255     | 383                  | 6      | 190     | 285                  | 4      | 125 | 188 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  | Fonte<br>GG(G)                         | M 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.0     | 0.50                 | 12     | 1275    | 638                  | 10     | 1060    | 530                  | 8      | 850 | 425 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 4.0     | 0.70                 | 12     | 955     | 669                  | 10     | 795     | 557                  | 8      | 635 | 445 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5.0     | 0.80                 | 12     | 765     | 612                  | 10     | 635     | 508                  | 8      | 510 | 408 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 6.0     | 1.00                 | 12     | 635     | 635                  | 10     | 530     | 530                  | 8      | 425 | 425 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 8.0     | 1.25                 | 12     | 475     | 594                  | 10     | 400     | 500                  | 8      | 320 | 400 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        | M10                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 10.0    | 1.50                 | 12     | 380     | 570                  | 10     | 320     | 480                  | 8      | 255 | 383 |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |
|                                                                                  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |         |                      |        |         |                      |        |         |                      |        |     |     |   |   |   |       |   |       |       |   |       |       |   |       |  |      |      |         |                      |        |         |                      |        |         |                      |        |



Extra longue



M

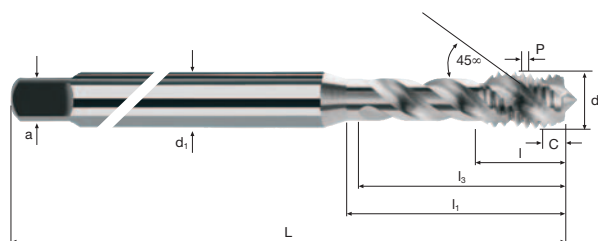
**ISO 2  
(6H)**



**HSS  
PM/F**



Form C



M

**Rm**  
**< 850**

GG(G)  
Aluminium[illegible]



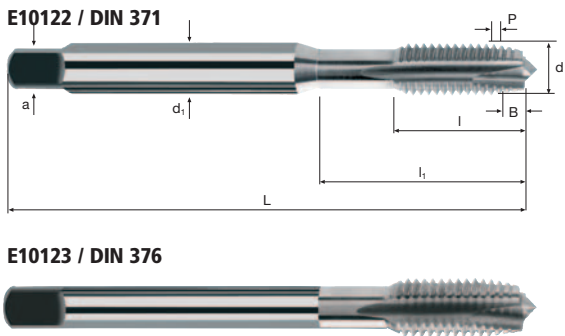


M-LH

ISO 2  
(6H)

HSS-E  
Co5

X - P  
Form B



Rm  
< 850

Inox  
Stainless

GG(G)  
Aluminium  
Copper

| Exemple: N° cde |       |      |    |     |      |      |      |     |   |      | N° d'article |  | Code-ø |  |  |  |
|-----------------|-------|------|----|-----|------|------|------|-----|---|------|--------------|--|--------|--|--|--|
|                 |       |      |    |     |      |      |      |     |   |      | E10122       |  | .034   |  |  |  |
| Ø<br>Code       | d     | P    |    | L   | l    | l1   | d1   | a   |   |      |              |  |        |  |  |  |
| .034            | M 2   | 0.40 | LH | 45  | 8.0  | —    | 2.8  | 2.1 | 2 | 1.60 | ●            |  |        |  |  |  |
| .040            | M 2.5 | 0.45 | LH | 50  | 9.0  | —    | 2.8  | 2.1 | 2 | 2.05 | ●            |  |        |  |  |  |
| .044            | M 3   | 0.50 | LH | 56  | 12.0 | 18.0 | 3.5  | 2.7 | 3 | 2.50 | ●            |  |        |  |  |  |
| .058            | M 4   | 0.70 | LH | 63  | 13.0 | 21.0 | 4.5  | 3.4 | 3 | 3.30 | ●            |  |        |  |  |  |
| .084            | M 5   | 0.80 | LH | 70  | 15.0 | 25.0 | 6.0  | 4.9 | 3 | 4.20 | ●            |  |        |  |  |  |
| .088            | M 6   | 1.00 | LH | 80  | 17.0 | 30.0 | 6.0  | 4.9 | 3 | 5.00 | ●            |  |        |  |  |  |
| .160            | M 8   | 1.25 | LH | 90  | 20.0 | 35.0 | 8.0  | 6.2 | 3 | 6.80 | ●            |  |        |  |  |  |
| .174            | M10   | 1.50 | LH | 100 | 22.0 | 39.0 | 10.0 | 8.0 | 3 | 8.50 | ●            |  |        |  |  |  |

| Exemple: N° cde |     |      |    |     |      |      |      |      |   |       | N° d'article |  | Code-ø |  |  |  |
|-----------------|-----|------|----|-----|------|------|------|------|---|-------|--------------|--|--------|--|--|--|
|                 |     |      |    |     |      |      |      |      |   |       | E10123       |  | .240   |  |  |  |
| Ø<br>Code       | d   | P    |    | L   | l    | l1   | d1   | a    |   |       |              |  |        |  |  |  |
| .240            | M12 | 1.75 | LH | 110 | 24.0 | 40.0 | 9.0  | 7.0  | 3 | 10.20 | ●            |  |        |  |  |  |
| .246            | M16 | 2.00 | LH | 110 | 27.0 | 40.0 | 12.0 | 9.0  | 3 | 14.00 | ●            |  |        |  |  |  |
| .314            | M20 | 2.50 | LH | 140 | 32.0 | 50.0 | 16.0 | 12.0 | 4 | 17.50 | ●            |  |        |  |  |  |
| .320            | M24 | 3.00 | LH | 160 | 34.0 | 60.0 | 18.0 | 14.5 | 4 | 21.00 | ●            |  |        |  |  |  |
|                 |     |      |    |     |      |      |      |      |   |       |              |  |        |  |  |  |
|                 |     |      |    |     |      |      |      |      |   |       |              |  |        |  |  |  |
|                 |     |      |    |     |      |      |      |      |   |       |              |  |        |  |  |  |
|                 |     |      |    |     |      |      |      |      |   |       |              |  |        |  |  |  |
|                 |     |      |    |     |      |      |      |      |   |       |              |  |        |  |  |  |



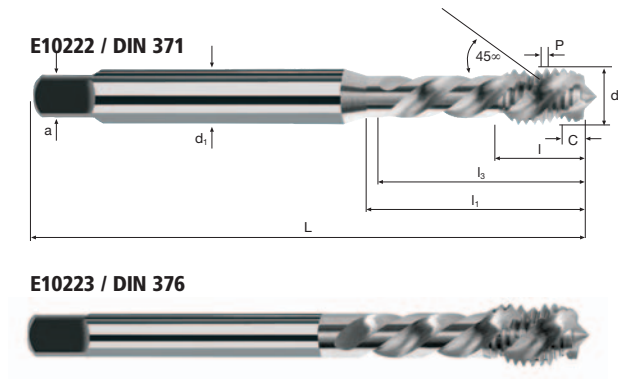


M-LH

ISO 2  
(6H)

HSS-E  
Co5

Form C



Rm  
< 850

Inox  
Stainless

GG(G)  
Aluminium  
Copper

| Exemple:<br>N° cde |       |      |    |     |      |                |                |                |     |                                                                                   |                                                                                   | N° d'article<br>E10222 |  | Code-ø<br>.034 |  | E10222 |  |  |
|--------------------|-------|------|----|-----|------|----------------|----------------|----------------|-----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------|--|----------------|--|--------|--|--|
| Ø<br>Code          | d     | P    |    | L   | l    | l <sub>1</sub> | l <sub>3</sub> | d <sub>1</sub> | a   |  |  |                        |  |                |  |        |  |  |
| .034               | M 2   | 0.40 | LH | 45  | 8.0  | –              | 10.5           | 2.8            | 2.1 | 3                                                                                 | 1.60                                                                              | ●                      |  |                |  |        |  |  |
| .040               | M 2.5 | 0.45 | LH | 50  | 9.0  | –              | 13.0           | 2.8            | 2.1 | 3                                                                                 | 2.05                                                                              | ●                      |  |                |  |        |  |  |
| .044               | M 3   | 0.50 | LH | 56  | 4.0  | 18.0           | 16.0           | 3.5            | 2.7 | 3                                                                                 | 2.50                                                                              | ●                      |  |                |  |        |  |  |
| .058               | M 4   | 0.70 | LH | 63  | 5.6  | 21.0           | 19.0           | 4.5            | 3.4 | 3                                                                                 | 3.30                                                                              | ●                      |  |                |  |        |  |  |
| .084               | M 5   | 0.80 | LH | 70  | 6.4  | 25.0           | 23.0           | 6.0            | 4.9 | 3                                                                                 | 4.20                                                                              | ●                      |  |                |  |        |  |  |
| .088               | M 6   | 1.00 | LH | 80  | 8.0  | 30.0           | 28.0           | 6.0            | 4.9 | 3                                                                                 | 5.00                                                                              | ●                      |  |                |  |        |  |  |
| .160               | M 8   | 1.25 | LH | 90  | 10.0 | 35.0           | 33.0           | 8.0            | 6.2 | 3                                                                                 | 6.80                                                                              | ●                      |  |                |  |        |  |  |
| .174               | M10   | 1.50 | LH | 100 | 12.0 | 39.0           | 37.0           | 10.0           | 8.0 | 3                                                                                 | 8.50                                                                              | ●                      |  |                |  |        |  |  |

| Exemple:<br>N° cde |     |      |    |     |      |                |                |                |      |                                                                                     |                                                                                     | N° d'article<br>E10223 |  | Code-ø<br>.240 |  |  |  |
|--------------------|-----|------|----|-----|------|----------------|----------------|----------------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------|--|----------------|--|--|--|
| Ø<br>Code          | d   | P    |    | L   | l    | l <sub>1</sub> | l <sub>3</sub> | d <sub>1</sub> | a    |  |  |                        |  |                |  |  |  |
| .240               | M12 | 1.75 | LH | 110 | 14.0 | 50.0           | 48.0           | 9.0            | 7.0  | 3                                                                                   | 10.20                                                                               | ●                      |  |                |  |  |  |
| .246               | M16 | 2.00 | LH | 110 | 16.0 | 58.0           | 56.0           | 12.0           | 9.0  | 4                                                                                   | 14.00                                                                               | ●                      |  |                |  |  |  |
| .314               | M20 | 2.50 | LH | 140 | 20.0 | 72.0           | 70.0           | 16.0           | 12.0 | 4                                                                                   | 17.50                                                                               | ●                      |  |                |  |  |  |
| .320               | M24 | 3.00 | LH | 160 | 24.0 | 74.0           | 72.0           | 18.0           | 14.5 | 4                                                                                   | 21.00                                                                               | ●                      |  |                |  |  |  |
|                    |     |      |    |     |      |                |                |                |      |                                                                                     |                                                                                     |                        |  |                |  |  |  |
|                    |     |      |    |     |      |                |                |                |      |                                                                                     |                                                                                     |                        |  |                |  |  |  |
|                    |     |      |    |     |      |                |                |                |      |                                                                                     |                                                                                     |                        |  |                |  |  |  |
|                    |     |      |    |     |      |                |                |                |      |                                                                                     |                                                                                     |                        |  |                |  |  |  |
|                    |     |      |    |     |      |                |                |                |      |                                                                                     |                                                                                     |                        |  |                |  |  |  |



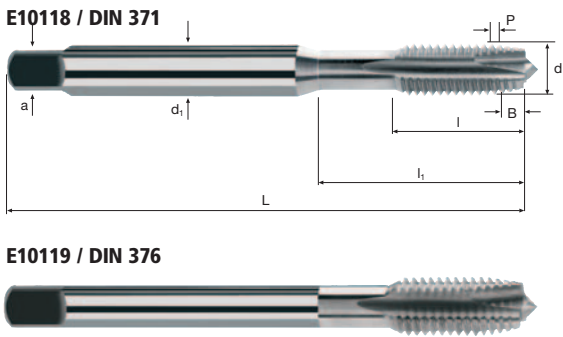


M

ISO 2  
+0.1

HSS-E  
Co5

X - P  
Form B



Rm  
< 850

Inox  
Stainless

GG(G)  
Aluminium  
Copper

| Exemple: N° cde |       |      |     |    |                |                |     |   |        | N° d'article |  | Code-ø |  |        |  |
|-----------------|-------|------|-----|----|----------------|----------------|-----|---|--------|--------------|--|--------|--|--------|--|
|                 |       |      |     |    |                |                |     |   |        | E10118       |  | .034   |  | E10118 |  |
| Ø<br>Code       | d     | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   | Δ      |              |  |        |  |        |  |
| .034            | M 2   | 0.40 | 45  | 8  | —              | 2.8            | 2.1 | 2 | +0.100 | ●            |  |        |  |        |  |
| .040            | M 2.5 | 0.45 | 50  | 9  | —              | 2.8            | 2.1 | 2 | +0.100 | ●            |  |        |  |        |  |
| .044            | M 3   | 0.50 | 56  | 12 | 18.0           | 3.5            | 2.7 | 3 | +0.100 | ●            |  |        |  |        |  |
| .058            | M 4   | 0.70 | 63  | 13 | 21.0           | 4.5            | 3.4 | 3 | +0.100 | ●            |  |        |  |        |  |
| .084            | M 5   | 0.80 | 70  | 15 | 25.0           | 6.0            | 4.9 | 3 | +0.100 | ●            |  |        |  |        |  |
| .088            | M 6   | 1.00 | 80  | 17 | 30.0           | 6.0            | 4.9 | 3 | +0.100 | ●            |  |        |  |        |  |
| .160            | M 8   | 1.25 | 90  | 20 | 35.0           | 8.0            | 6.2 | 3 | +0.100 | ●            |  |        |  |        |  |
| .174            | M10   | 1.50 | 100 | 22 | 39.0           | 10.0           | 8.0 | 3 | +0.100 | ●            |  |        |  |        |  |

| Exemple: N° cde |     |      |     |    |                |                |      |   |        | N° d'article |  | Code-ø |  |        |  |
|-----------------|-----|------|-----|----|----------------|----------------|------|---|--------|--------------|--|--------|--|--------|--|
|                 |     |      |     |    |                |                |      |   |        | E10119       |  | .240   |  | E10119 |  |
| Ø<br>Code       | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a    |   | Δ      |              |  |        |  |        |  |
| .240            | M12 | 1.75 | 110 | 24 | 40.0           | 9.0            | 7.0  | 3 | +0.100 | ●            |  |        |  |        |  |
| .246            | M16 | 2.00 | 110 | 27 | 40.0           | 12.0           | 9.0  | 4 | +0.100 | ●            |  |        |  |        |  |
| .314            | M20 | 2.50 | 140 | 32 | 50.0           | 16.0           | 12.0 | 4 | +0.100 | ●            |  |        |  |        |  |
| .320            | M24 | 3.00 | 160 | 34 | 60.0           | 18.0           | 14.5 | 4 | +0.100 | ●            |  |        |  |        |  |
|                 |     |      |     |    |                |                |      |   |        |              |  |        |  |        |  |
|                 |     |      |     |    |                |                |      |   |        |              |  |        |  |        |  |
|                 |     |      |     |    |                |                |      |   |        |              |  |        |  |        |  |
|                 |     |      |     |    |                |                |      |   |        |              |  |        |  |        |  |
|                 |     |      |     |    |                |                |      |   |        |              |  |        |  |        |  |





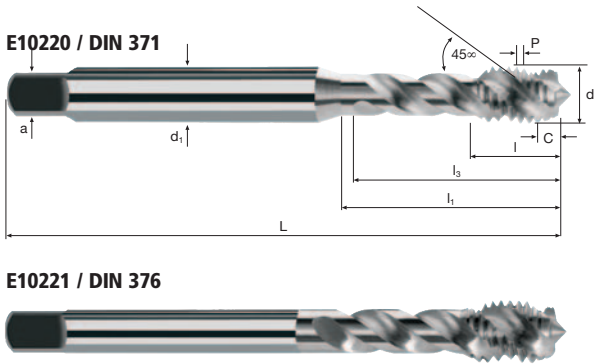


M

ISO 2  
+0.1

HSS-E  
Co5

Form C



Rm  
< 850

Inox  
Stainless

GG(G)  
Aluminium  
Copper

| Exemple: N° cde |       |      |     |      |      |      |      |     |   |        |   | N° d'article |  | Code-ø |  |  |  |
|-----------------|-------|------|-----|------|------|------|------|-----|---|--------|---|--------------|--|--------|--|--|--|
|                 |       |      |     |      |      |      |      |     |   |        |   | E10220       |  | .034   |  |  |  |
| Ø<br>Code       | d     | P    | L   | l    | l1   | l3   | d1   | a   |   | Δ      |   |              |  |        |  |  |  |
| .034            | M 2   | 0.40 | 45  | 8.0  | —    | 10.5 | 2.8  | 2.1 | 3 | +0.100 | ● |              |  |        |  |  |  |
| .040            | M 2.5 | 0.45 | 50  | 9.0  | —    | 13.0 | 2.8  | 2.1 | 3 | +0.100 | ● |              |  |        |  |  |  |
| .044            | M 3   | 0.50 | 56  | 4.0  | 18.0 | 16.0 | 3.5  | 2.7 | 3 | +0.100 | ● |              |  |        |  |  |  |
| .058            | M 4   | 0.70 | 63  | 5.6  | 21.0 | 19.0 | 4.5  | 3.4 | 3 | +0.100 | ● |              |  |        |  |  |  |
| .084            | M 5   | 0.80 | 70  | 6.4  | 25.0 | 23.0 | 6.0  | 4.9 | 3 | +0.100 | ● |              |  |        |  |  |  |
| .088            | M 6   | 1.00 | 80  | 8.0  | 30.0 | 28.0 | 6.0  | 4.9 | 3 | +0.100 | ● |              |  |        |  |  |  |
| .160            | M 8   | 1.25 | 90  | 10.0 | 35.0 | 33.0 | 8.0  | 6.2 | 3 | +0.100 | ● |              |  |        |  |  |  |
| .174            | M10   | 1.50 | 100 | 12.0 | 39.0 | 37.0 | 10.0 | 8.0 | 3 | +0.100 | ● |              |  |        |  |  |  |

| Exemple: N° cde |     |      |     |      |      |      |      |      |   |        |   | N° d'article |  | Code-ø |  |  |  |
|-----------------|-----|------|-----|------|------|------|------|------|---|--------|---|--------------|--|--------|--|--|--|
|                 |     |      |     |      |      |      |      |      |   |        |   | E10221       |  | .240   |  |  |  |
| Ø<br>Code       | d   | P    | L   | l    | l1   | l3   | d1   | a    |   | Δ      |   |              |  |        |  |  |  |
| .240            | M12 | 1.75 | 110 | 14.0 | 50.0 | 48.0 | 9.0  | 7.0  | 3 | +0.100 | ● |              |  |        |  |  |  |
| .246            | M16 | 2.00 | 110 | 16.0 | 58.0 | 56.0 | 12.0 | 9.0  | 4 | +0.100 | ● |              |  |        |  |  |  |
| .314            | M20 | 2.50 | 140 | 20.0 | 72.0 | 70.0 | 16.0 | 12.0 | 4 | +0.100 | ● |              |  |        |  |  |  |
| .320            | M24 | 3.00 | 160 | 24.0 | 74.0 | 72.0 | 18.0 | 14.5 | 4 | +0.100 | ● |              |  |        |  |  |  |
|                 |     |      |     |      |      |      |      |      |   |        |   |              |  |        |  |  |  |
|                 |     |      |     |      |      |      |      |      |   |        |   |              |  |        |  |  |  |
|                 |     |      |     |      |      |      |      |      |   |        |   |              |  |        |  |  |  |
|                 |     |      |     |      |      |      |      |      |   |        |   |              |  |        |  |  |  |



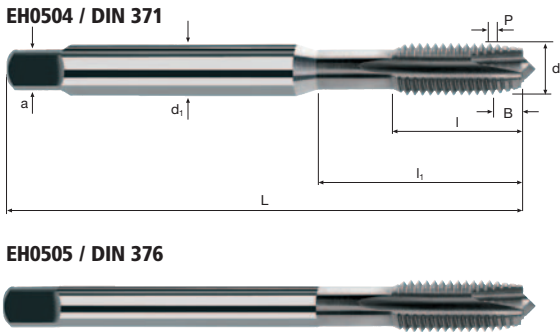
M

ISO 3  
(6G)

HSS  
PM/F

DIN  
371/376

Form B



|             |                |                 |  |  |  |  |  |  |  |
|-------------|----------------|-----------------|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  |  |  |  |
|-------------|----------------|-----------------|--|--|--|--|--|--|--|

| Example:<br>N° cde |       |      |     |    |      |      |     |   |        | TiCN   |   |
|--------------------|-------|------|-----|----|------|------|-----|---|--------|--------|---|
| N° d'article       |       |      |     |    |      |      |     |   |        | EH0504 |   |
| Code-ø             |       |      |     |    |      |      |     |   |        |        |   |
| Ø<br>Code          | d     | P    | L   | l  | l1   | d1   | a   |   | Δ      |        |   |
| .034               | M 2   | 0.40 | 45  | 8  | —    | 2.8  | 2.1 | 2 | +0.015 |        | ● |
| .040               | M 2.5 | 0.45 | 50  | 9  | —    | 2.8  | 2.1 | 2 | +0.015 |        | ● |
| .044               | M 3   | 0.50 | 56  | 12 | 18.0 | 3.5  | 2.7 | 3 | +0.016 |        | ● |
| .058               | M 4   | 0.70 | 63  | 13 | 21.0 | 4.5  | 3.4 | 3 | +0.019 |        | ● |
| .084               | M 5   | 0.80 | 70  | 15 | 25.0 | 6.0  | 4.9 | 3 | +0.020 |        | ● |
| .088               | M 6   | 1.00 | 80  | 17 | 30.0 | 6.0  | 4.9 | 3 | +0.024 |        | ● |
| .160               | M 8   | 1.25 | 90  | 20 | 35.0 | 8.0  | 6.2 | 3 | +0.025 |        | ● |
| .174               | M10   | 1.50 | 100 | 22 | 39.0 | 10.0 | 8.0 | 3 | +0.028 |        | ● |

| Example:<br>N° cde |      |      |     |    |      |      |      |   |        | TiCN   |   |
|--------------------|------|------|-----|----|------|------|------|---|--------|--------|---|
| N° d'article       |      |      |     |    |      |      |      |   |        | EH0505 |   |
| Code-ø             |      |      |     |    |      |      |      |   |        |        |   |
| Ø<br>Code          | d    | P    | L   | l  | l1   | d1   | a    |   | Δ      |        |   |
| .240               | M 12 | 1.75 | 110 | 24 | 40.0 | 9.0  | 7.0  | 3 | +0.032 |        | ● |
| .246               | M 16 | 2.00 | 110 | 27 | 40.0 | 12.0 | 9.0  | 3 | +0.034 |        | ● |
| .314               | M 20 | 2.50 | 140 | 32 | 50.0 | 16.0 | 12.0 | 4 | +0.036 |        | ● |
| .320               | M 24 | 3.00 | 160 | 34 | 60.0 | 18.0 | 14.5 | 4 | +0.042 |        | ● |
|                    |      |      |     |    |      |      |      |   |        |        |   |
|                    |      |      |     |    |      |      |      |   |        |        |   |
|                    |      |      |     |    |      |      |      |   |        |        |   |
|                    |      |      |     |    |      |      |      |   |        |        |   |

| Application | Matières                               | M     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-------------|----------------------------------------|-------|-----------|-----------|------------------------------------------|-----------------|------------------------------------------|-----------------|------------------------------------------|-----------------|
|             | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M 2   | 2.0       | 0.40      | 32                                       | 5095            | 2038                                     | 28              | 4455                                     | 1782            |
|             |                                        | M 2.5 | 2.5       | 0.45      | 32                                       | 4075            | 1834                                     | 28              | 3565                                     | 1604            |
|             |                                        | M 3   | 3.0       | 0.50      | 32                                       | 3395            | 1698                                     | 28              | 2970                                     | 1485            |
|             |                                        | M 4   | 4.0       | 0.70      | 32                                       | 2545            | 1782                                     | 28              | 2230                                     | 1561            |
|             |                                        | M 5   | 5.0       | 0.80      | 32                                       | 2035            | 1628                                     | 28              | 1785                                     | 1428            |
|             |                                        | M 6   | 6.0       | 1.00      | 32                                       | 1700            | 1700                                     | 28              | 1485                                     | 1485            |
|             |                                        | M 8   | 8.0       | 1.25      | 32                                       | 1275            | 1594                                     | 28              | 1115                                     | 1394            |
|             |                                        | M10   | 10.0      | 1.50      | 32                                       | 1020            | 1530                                     | 28              | 890                                      | 1335            |
|             |                                        | M12   | 12.0      | 1.75      | 32                                       | 850             | 1488                                     | 28              | 745                                      | 1304            |
|             |                                        |       |           |           |                                          |                 |                                          |                 |                                          |                 |
|             |                                        |       |           |           |                                          |                 |                                          |                 |                                          |                 |
|             |                                        |       |           |           |                                          |                 |                                          |                 |                                          |                 |
|             | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M16   | 16.0      | 2.00      | 32                                       | 635             | 1270                                     | 28              | 555                                      | 1110            |
|             |                                        | M20   | 20.0      | 2.50      | 32                                       | 510             | 1275                                     | 28              | 445                                      | 1113            |
|             |                                        | M24   | 24.0      | 3.00      | 32                                       | 425             | 1275                                     | 28              | 370                                      | 1110            |
|             |                                        |       |           |           |                                          |                 |                                          |                 |                                          |                 |
|             |                                        |       |           |           |                                          |                 |                                          |                 |                                          |                 |
|             | Aciers<br>850 - 1100 N/mm <sup>2</sup> | M 2   | 2.0       | 0.40      | 20                                       | 3185            | 1274                                     | 16              | 2545                                     | 1018            |
|             |                                        | M 2.5 | 2.5       | 0.45      | 20                                       | 2545            | 1145                                     | 16              | 2035                                     | 916             |
|             |                                        | M 3   | 3.0       | 0.50      | 20                                       | 2120            | 1060                                     | 16              | 1700                                     | 850             |
|             |                                        | M 4   | 4.0       | 0.70      | 20                                       | 1590            | 1113                                     | 16              | 1275                                     | 893             |
|             |                                        | M 5   | 5.0       | 0.80      | 20                                       | 1275            | 1020                                     | 16              | 1020                                     | 816             |
|             |                                        | M 6   | 6.0       | 1.00      | 20                                       | 1060            | 1060                                     | 16              | 850                                      | 850             |
|             |                                        | M 8   | 8.0       | 1.25      | 20                                       | 795             | 994                                      | 16              | 635                                      | 794             |
|             |                                        | M10   | 10.0      | 1.50      | 20                                       | 635             | 953                                      | 16              | 510                                      | 765             |
|             |                                        | M12   | 12.0      | 1.75      | 20                                       | 530             | 928                                      | 16              | 425                                      | 744             |
|             |                                        |       |           |           |                                          |                 |                                          |                 |                                          |                 |
|             |                                        |       |           |           |                                          |                 |                                          |                 |                                          |                 |
|             |                                        |       |           |           |                                          |                 |                                          |                 |                                          |                 |
|             | Aciers<br>850 - 1100 N/mm <sup>2</sup> | M16   | 16.0      | 2.00      | 20                                       | 400             | 800                                      | 16              | 320                                      | 640             |
|             |                                        | M20   | 20.0      | 2.50      | 20                                       | 320             | 800                                      | 16              | 255                                      | 638             |
|             |                                        | M24   | 24.0      | 3.00      | 20                                       | 265             | 795                                      | 16              | 210                                      | 630             |
|             |                                        |       |           |           |                                          |                 |                                          |                 |                                          |                 |
|             |                                        |       |           |           |                                          |                 |                                          |                 |                                          |                 |

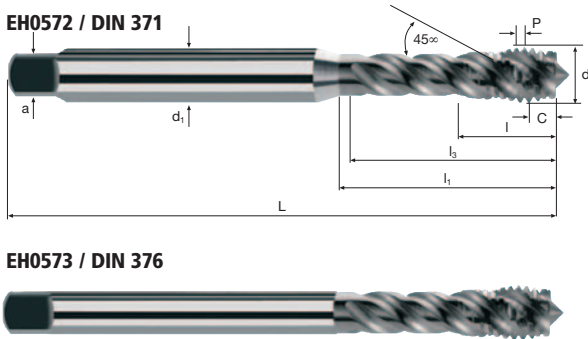
M

ISO 3  
(6G)

HSS  
PM/F

DIN  
371/376

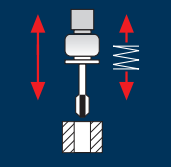
Form C



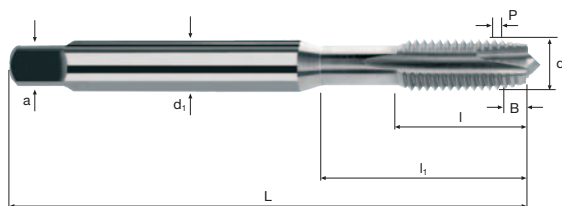
|             |                |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|

| Exemple: N° cde |       |      |     |    |      |      |      |     |   |        | TiCN   |
|-----------------|-------|------|-----|----|------|------|------|-----|---|--------|--------|
| N° d'article    |       |      |     |    |      |      |      |     |   |        | EH0572 |
| Code-ø          |       |      |     |    |      |      |      |     |   |        |        |
| Ø<br>Code       | d     | P    | L   | l  | l1   | l3   | d1   | a   |   | Δ      |        |
| .034            | M 2   | 0.40 | 45  | 8  | —    | 10.5 | 2.8  | 2.1 | 3 | +0.015 | ●      |
| .040            | M 2.5 | 0.45 | 50  | 9  | —    | 13.0 | 2.8  | 2.1 | 3 | +0.015 | ●      |
| .044            | M 3   | 0.50 | 56  | 5  | —    | 16.0 | 3.5  | 2.7 | 3 | +0.016 | ●      |
| .058            | M 4   | 0.70 | 63  | 7  | —    | 19.0 | 4.5  | 3.4 | 3 | +0.019 | ●      |
| .084            | M 5   | 0.80 | 70  | 8  | —    | 23.0 | 6.0  | 4.9 | 3 | +0.020 | ●      |
| .088            | M 6   | 1.00 | 80  | 10 | —    | 28.0 | 6.0  | 4.9 | 3 | +0.024 | ●      |
| .160            | M 8   | 1.25 | 90  | 13 | 35.0 | 33.0 | 8.0  | 6.2 | 3 | +0.025 | ●      |
| .174            | M10   | 1.50 | 100 | 15 | 39.0 | 37.0 | 10.0 | 8.0 | 4 | +0.028 | ●      |

| Exemple: N° cde |     |      |     |    |      |      |      |      |   |        | TiCN   |
|-----------------|-----|------|-----|----|------|------|------|------|---|--------|--------|
| N° d'article    |     |      |     |    |      |      |      |      |   |        | EH0573 |
| Code-ø          |     |      |     |    |      |      |      |      |   |        |        |
| Ø<br>Code       | d   | P    | L   | l  | l1   | l3   | d1   | a    |   | Δ      |        |
| .240            | M12 | 1.75 | 110 | 18 | 50.0 | 48.0 | 9.0  | 7.0  | 4 | +0.032 | ●      |
| .246            | M16 | 2.00 | 110 | 20 | 58.0 | 56.0 | 12.0 | 9.0  | 4 | +0.034 | ●      |
| .314            | M20 | 2.50 | 140 | 25 | 72.0 | 70.0 | 16.0 | 12.0 | 4 | +0.036 | ●      |
| .320            | M24 | 3.00 | 160 | 30 | 74.0 | 72.0 | 18.0 | 14.5 | 5 | +0.042 | ●      |
|                 |     |      |     |    |      |      |      |      |   |        |        |
|                 |     |      |     |    |      |      |      |      |   |        |        |
|                 |     |      |     |    |      |      |      |      |   |        |        |
|                 |     |      |     |    |      |      |      |      |   |        |        |

| Application                                                                      | Matières                               | M     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>3.0 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|----------------------------------------------------------------------------------|----------------------------------------|-------|-----------|-----------|-----------------------------|---------------------------|-----------------|-----------------------------|---------------------------|-----------------|-----------------------------|---------------------------|-----------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup>      | M 2   | 2.0       | 0.40      | 14                          | 2230                      | 892             | 12                          | 1910                      | 764             | 10                          | 1590                      | 636             |
|                                                                                  |                                        | M 2.5 | 2.5       | 0.45      | 14                          | 1785                      | 803             | 12                          | 1530                      | 689             | 10                          | 1275                      | 574             |
|                                                                                  |                                        | M 3   | 3.0       | 0.50      | 18                          | 1910                      | 955             | 15                          | 1590                      | 795             | 12                          | 1275                      | 638             |
|                                                                                  |                                        | M 4   | 4.0       | 0.70      | 18                          | 1430                      | 1001            | 15                          | 1195                      | 837             | 12                          | 955                       | 669             |
|                                                                                  |                                        | M 5   | 5.0       | 0.80      | 18                          | 1145                      | 916             | 15                          | 955                       | 764             | 12                          | 765                       | 612             |
|                                                                                  |                                        | M 6   | 6.0       | 1.00      | 18                          | 955                       | 955             | 15                          | 795                       | 795             | 12                          | 635                       | 635             |
|                                                                                  |                                        | M 8   | 8.0       | 1.25      | 18                          | 715                       | 894             | 15                          | 595                       | 744             | 12                          | 475                       | 594             |
|                                                                                  |                                        | M10   | 10.0      | 1.50      | 18                          | 575                       | 863             | 15                          | 475                       | 713             | 12                          | 380                       | 570             |
|                                                                                  |                                        | M 2   | 2.0       | 0.40      | 12                          | 1910                      | 764             | 8                           | 1275                      | 510             | 6                           | 955                       | 382             |
|                                                                                  |                                        | M 2.5 | 2.5       | 0.45      | 12                          | 1530                      | 689             | 8                           | 1020                      | 459             | 6                           | 765                       | 344             |
|                                                                                  |                                        | M 3   | 3.0       | 0.50      | 15                          | 1590                      | 795             | 10                          | 1060                      | 530             | 8                           | 850                       | 425             |
|                                                                                  |                                        | M 4   | 4.0       | 0.70      | 15                          | 1195                      | 837             | 10                          | 795                       | 557             | 8                           | 635                       | 445             |
|                                                                                  |                                        | M 5   | 5.0       | 0.80      | 15                          | 955                       | 764             | 10                          | 635                       | 508             | 8                           | 510                       | 408             |
|                                                                                  |                                        | M 6   | 6.0       | 1.00      | 15                          | 795                       | 795             | 10                          | 530                       | 530             | 8                           | 425                       | 425             |
|                                                                                  |                                        | M 8   | 8.0       | 1.25      | 15                          | 595                       | 744             | 10                          | 400                       | 500             | 8                           | 320                       | 400             |
|                                                                                  |                                        | M10   | 10.0      | 1.50      | 15                          | 475                       | 713             | 10                          | 320                       | 480             | 8                           | 255                       | 383             |
|                                                                                  | Aluminium corroyé<br>Si < 6%<br>trempé | M 2   | 2.0       | 0.40      | 12                          | 1910                      | 764             | 10                          | 1590                      | 636             | 8                           | 1275                      | 510             |
|                                                                                  |                                        | M 2.5 | 2.5       | 0.45      | 12                          | 1530                      | 689             | 10                          | 1275                      | 574             | 8                           | 1020                      | 459             |
|                                                                                  |                                        | M 3   | 3.0       | 0.50      | 15                          | 1590                      | 795             | 12                          | 1275                      | 638             | 10                          | 1060                      | 530             |
|                                                                                  |                                        | M 4   | 4.0       | 0.70      | 15                          | 1195                      | 837             | 12                          | 955                       | 669             | 10                          | 795                       | 557             |
|                                                                                  |                                        | M 5   | 5.0       | 0.80      | 15                          | 955                       | 764             | 12                          | 765                       | 612             | 10                          | 635                       | 508             |
|                                                                                  |                                        | M 6   | 6.0       | 1.00      | 15                          | 795                       | 795             | 12                          | 635                       | 635             | 10                          | 530                       | 530             |
|                                                                                  |                                        | M 8   | 8.0       | 1.25      | 15                          | 595                       | 744             | 12                          | 475                       | 594             | 10                          | 400                       | 500             |
|                                                                                  |                                        | M10   | 10.0      | 1.50      | 15                          | 475                       | 713             | 12                          | 380                       | 570             | 10                          | 320                       | 480             |
|                                                                                  | Aciers inoxydables<br>[Cr-Ni/1.4301]   | M 2   | 2.0       | 0.40      | 4                           | 635                       | 254             | 3                           | 475                       | 190             | 2                           | 320                       | 128             |
|                                                                                  |                                        | M 2.5 | 2.5       | 0.45      | 4                           | 510                       | 230             | 3                           | 380                       | 171             | 2                           | 255                       | 115             |
|                                                                                  |                                        | M 3   | 3.0       | 0.50      | 5                           | 530                       | 265             | 4                           | 425                       | 213             | 3                           | 320                       | 160             |
|                                                                                  |                                        | M 4   | 4.0       | 0.70      | 5                           | 400                       | 280             | 4                           | 320                       | 224             | 3                           | 240                       | 168             |
|                                                                                  |                                        | M 5   | 5.0       | 0.80      | 5                           | 320                       | 256             | 4                           | 255                       | 204             | 3                           | 190                       | 152             |
|                                                                                  |                                        | M 6   | 6.0       | 1.00      | 5                           | 265                       | 265             | 4                           | 210                       | 210             | 3                           | 160                       | 160             |
|                                                                                  |                                        | M 8   | 8.0       | 1.25      | 5                           | 200                       | 250             | 4                           | 160                       | 200             | 3                           | 120                       | 150             |
|                                                                                  |                                        | M10   | 10.0      | 1.50      | 5                           | 160                       | 240             | 4                           | 125                       | 188             | 3                           | 95                        | 143             |

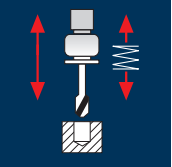
Form B



M

**GG(G)**  
**Aluminium**  
**Copper**

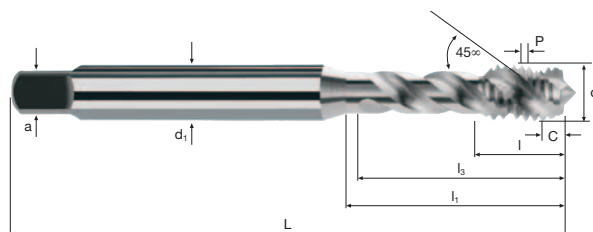
[illegible]

| Application                                                                      | Matières                          | M     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[m/min] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|----------------------------------------------------------------------------------|-----------------------------------|-------|-----------|-----------|-----------------------------|---------------------------|-----------------|-----------------------------|---------------------------|-----------------|-----------------------------|---------------------------|-----------------|
|  | Aciers<br>< 500 N/mm <sup>2</sup> | M 2   | 2.0       | 0.40      | 11                          | 1750                      | 700             | 10                          | 1590                      | 636             | 8                           | 1275                      | 510             |
|                                                                                  |                                   | M 2.5 | 2.5       | 0.45      | 11                          | 1400                      | 630             | 10                          | 1275                      | 574             | 8                           | 1020                      | 459             |
|                                                                                  |                                   | M 3   | 3.0       | 0.50      | 14                          | 1485                      | 743             | 12                          | 1275                      | 638             | 10                          | 1060                      | 530             |
|                                                                                  |                                   | M 4   | 4.0       | 0.70      | 14                          | 1115                      | 781             | 12                          | 955                       | 669             | 10                          | 795                       | 557             |
|                                                                                  |                                   | M 5   | 5.0       | 0.80      | 14                          | 890                       | 712             | 12                          | 765                       | 612             | 10                          | 635                       | 508             |
|                                                                                  |                                   | M 6   | 6.0       | 1.00      | 14                          | 745                       | 745             | 12                          | 635                       | 635             | 10                          | 530                       | 530             |
|                                                                                  |                                   | M 8   | 8.0       | 1.25      | 14                          | 555                       | 694             | 12                          | 475                       | 594             | 10                          | 400                       | 500             |
|                                                                                  |                                   | M10   | 10.0      | 1.50      | 14                          | 445                       | 668             | 12                          | 380                       | 570             | 10                          | 320                       | 480             |
|                                                                                  |                                   | M 2   | 2.0       | 0.40      | 7                           | 1115                      | 446             | 6                           | 955                       | 382             | 5                           | 795                       | 318             |
|                                                                                  |                                   | M 2.5 | 2.5       | 0.45      | 7                           | 890                       | 401             | 6                           | 765                       | 344             | 5                           | 635                       | 286             |
|                                                                                  |                                   | M 3   | 3.0       | 0.50      | 9                           | 955                       | 478             | 8                           | 850                       | 425             | 7                           | 745                       | 373             |
|                                                                                  |                                   | M 4   | 4.0       | 0.70      | 9                           | 715                       | 500             | 8                           | 635                       | 445             | 7                           | 555                       | 389             |
|                                                                                  |                                   | M 5   | 5.0       | 0.80      | 9                           | 575                       | 460             | 8                           | 510                       | 408             | 7                           | 445                       | 356             |
|                                                                                  |                                   | M 6   | 6.0       | 1.00      | 9                           | 475                       | 475             | 8                           | 425                       | 425             | 7                           | 370                       | 370             |
|                                                                                  |                                   | M 8   | 8.0       | 1.25      | 9                           | 360                       | 450             | 8                           | 320                       | 400             | 7                           | 280                       | 350             |
|                                                                                  |                                   | M10   | 10.0      | 1.50      | 9                           | 285                       | 428             | 8                           | 255                       | 383             | 7                           | 225                       | 338             |
|                                                                                  |                                   | M 2   | 2.0       | 0.40      | 8                           | 1275                      | 510             | 6                           | 955                       | 382             | 5                           | 795                       | 318             |
|                                                                                  |                                   | M 2.5 | 2.5       | 0.45      | 8                           | 1020                      | 459             | 6                           | 765                       | 344             | 5                           | 635                       | 286             |
|                                                                                  |                                   | M 3   | 3.0       | 0.50      | 10                          | 1060                      | 530             | 8                           | 850                       | 425             | 6                           | 635                       | 318             |
|                                                                                  |                                   | M 4   | 4.0       | 0.70      | 10                          | 795                       | 557             | 8                           | 635                       | 445             | 6                           | 475                       | 333             |
|                                                                                  |                                   | M 5   | 5.0       | 0.80      | 10                          | 635                       | 508             | 8                           | 510                       | 408             | 6                           | 380                       | 304             |
|                                                                                  |                                   | M 6   | 6.0       | 1.00      | 10                          | 530                       | 530             | 8                           | 425                       | 425             | 6                           | 320                       | 320             |
|                                                                                  |                                   | M 8   | 8.0       | 1.25      | 10                          | 400                       | 500             | 8                           | 320                       | 400             | 6                           | 240                       | 300             |
|                                                                                  |                                   | M10   | 10.0      | 1.50      | 10                          | 320                       | 480             | 8                           | 255                       | 383             | 6                           | 190                       | 285             |
|                                                                                  |                                   | M 2   | 2.0       | 0.40      | 3                           | 475                       | 190             | 2                           | 320                       | 128             | 2                           | 320                       | 128             |
|                                                                                  |                                   | M 2.5 | 2.5       | 0.45      | 3                           | 380                       | 171             | 2                           | 255                       | 115             | 2                           | 255                       | 115             |
|                                                                                  |                                   | M 3   | 3.0       | 0.50      | 4                           | 425                       | 213             | 3                           | 320                       | 160             | 3                           | 320                       | 160             |
|                                                                                  |                                   | M 4   | 4.0       | 0.70      | 4                           | 320                       | 224             | 3                           | 240                       | 168             | 3                           | 240                       | 168             |
|                                                                                  |                                   | M 5   | 5.0       | 0.80      | 4                           | 255                       | 204             | 3                           | 190                       | 152             | 3                           | 190                       | 152             |
|                                                                                  |                                   | M 6   | 6.0       | 1.00      | 4                           | 210                       | 210             | 3                           | 160                       | 160             | 3                           | 160                       | 160             |
|                                                                                  |                                   | M 8   | 8.0       | 1.25      | 4                           | 160                       | 200             | 3                           | 120                       | 150             | 3                           | 120                       | 150             |
|                                                                                  |                                   | M10   | 10.0      | 1.50      | 4                           | 125                       | 188             | 3                           | 95                        | 143             | 3                           | 95                        | 143             |





Form C



M

**GG(G)**  
**Aluminium**  
**Copper**

237



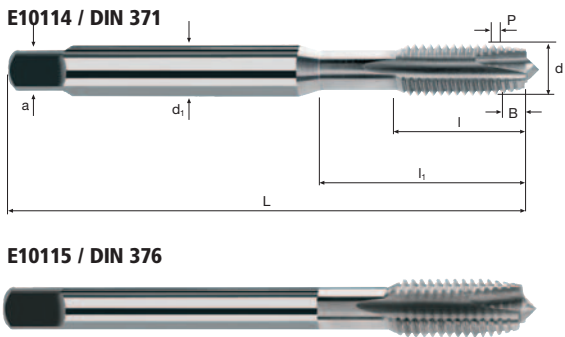


M

7G

HSS-E  
Co5

X - P  
Form B



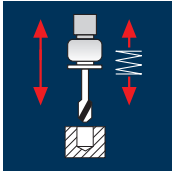
Rm  
< 850

Inox  
Stainless

GG(G)  
Aluminium  
Copper

| Exemple: N° cde |       |      |     |    |      |      |     |   |        | N° d'article |  | Code-ø |  |  |  |
|-----------------|-------|------|-----|----|------|------|-----|---|--------|--------------|--|--------|--|--|--|
|                 |       |      |     |    |      |      |     |   |        | E10114       |  | .034   |  |  |  |
| Ø<br>Code       | d     | P    | L   | l  | l1   | d1   | a   |   | Δ      |              |  |        |  |  |  |
| .034            | M 2   | 0.40 | 45  | 8  | —    | 2.8  | 2.1 | 2 | +0.030 | ●            |  |        |  |  |  |
| .040            | M 2.5 | 0.45 | 50  | 9  | —    | 2.8  | 2.1 | 2 | +0.030 | ●            |  |        |  |  |  |
| .044            | M 3   | 0.50 | 56  | 12 | 18.0 | 3.5  | 2.7 | 3 | +0.032 | ●            |  |        |  |  |  |
| .058            | M 4   | 0.70 | 63  | 13 | 21.0 | 4.5  | 3.4 | 3 | +0.038 | ●            |  |        |  |  |  |
| .084            | M 5   | 0.80 | 70  | 15 | 25.0 | 6.0  | 4.9 | 3 | +0.040 | ●            |  |        |  |  |  |
| .088            | M 6   | 1.00 | 80  | 17 | 30.0 | 6.0  | 4.9 | 3 | +0.048 | ●            |  |        |  |  |  |
| .160            | M 8   | 1.25 | 90  | 20 | 35.0 | 8.0  | 6.2 | 3 | +0.050 | ●            |  |        |  |  |  |
| .174            | M10   | 1.50 | 100 | 22 | 39.0 | 10.0 | 8.0 | 3 | +0.056 | ●            |  |        |  |  |  |

| Exemple: N° cde |     |      |     |    |      |      |      |   |        | N° d'article |  | Code-ø |  |  |  |
|-----------------|-----|------|-----|----|------|------|------|---|--------|--------------|--|--------|--|--|--|
|                 |     |      |     |    |      |      |      |   |        | E10115       |  | .240   |  |  |  |
| Ø<br>Code       | d   | P    | L   | l  | l1   | d1   | a    |   | Δ      |              |  |        |  |  |  |
| .240            | M12 | 1.75 | 110 | 24 | 40.0 | 9.0  | 7.0  | 3 | +0.064 | ●            |  |        |  |  |  |
| .246            | M16 | 2.00 | 110 | 27 | 40.0 | 12.0 | 9.0  | 3 | +0.068 | ●            |  |        |  |  |  |
| .314            | M20 | 2.50 | 140 | 32 | 50.0 | 16.0 | 12.0 | 4 | +0.072 | ●            |  |        |  |  |  |
| .320            | M24 | 3.00 | 160 | 34 | 60.0 | 18.0 | 14.5 | 4 | +0.085 | ●            |  |        |  |  |  |
|                 |     |      |     |    |      |      |      |   |        |              |  |        |  |  |  |
|                 |     |      |     |    |      |      |      |   |        |              |  |        |  |  |  |
|                 |     |      |     |    |      |      |      |   |        |              |  |        |  |  |  |
|                 |     |      |     |    |      |      |      |   |        |              |  |        |  |  |  |
|                 |     |      |     |    |      |      |      |   |        |              |  |        |  |  |  |

| Application                                                                      | Matières                  |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|----------------------------------------------------------------------------------|---------------------------|-------|-----------|-----------|--------------------------|--------------|--------------|--------------------------|--------------|--------------|--------------------------|--------------|--------------|
|  | Aciers<br>< 500 N/mm²     | M     | ø<br>[mm] | P<br>[mm] | Vc<br>1.0 x d<br>[min⁻¹] | n<br>[min⁻¹] | Vf<br>[100%] | Vc<br>1.5 x d<br>[min⁻¹] | n<br>[min⁻¹] | Vf<br>[100%] | Vc<br>2.0 x d<br>[min⁻¹] | n<br>[min⁻¹] | Vf<br>[100%] |
|                                                                                  |                           | M 2   | 2.0       | 0.40      | 11                       | 1750         | 700          | 10                       | 1590         | 636          | 8                        | 1275         | 510          |
|                                                                                  |                           | M 2.5 | 2.5       | 0.45      | 11                       | 1400         | 630          | 10                       | 1275         | 574          | 8                        | 1020         | 459          |
|                                                                                  |                           | M 3   | 3.0       | 0.50      | 14                       | 1485         | 743          | 12                       | 1275         | 638          | 10                       | 1060         | 530          |
|                                                                                  |                           | M 4   | 4.0       | 0.70      | 14                       | 1115         | 781          | 12                       | 955          | 669          | 10                       | 795          | 555          |
|                                                                                  |                           | M 5   | 5.0       | 0.80      | 14                       | 890          | 712          | 12                       | 765          | 612          | 10                       | 635          | 508          |
|                                                                                  |                           | M 6   | 6.0       | 1.00      | 14                       | 745          | 745          | 12                       | 635          | 635          | 10                       | 530          | 530          |
|                                                                                  |                           | M 8   | 8.0       | 1.25      | 14                       | 555          | 694          | 12                       | 475          | 594          | 10                       | 400          | 500          |
|                                                                                  |                           | M10   | 10.0      | 1.50      | 14                       | 445          | 668          | 12                       | 380          | 570          | 10                       | 320          | 480          |
|                                                                                  |                           | M12   | 12.0      | 1.75      | 14                       | 370          | 648          | 12                       | 320          | 560          | 10                       | 265          | 464          |
|                                                                                  | Aciers<br>< 500 N/mm²     | M16   | 16.0      | 2.00      | 14                       | 280          | 560          | 12                       | 240          | 480          | 10                       | 200          | 400          |
|                                                                                  |                           | M20   | 20.0      | 2.50      | 14                       | 225          | 563          | 12                       | 190          | 475          | 10                       | 160          | 400          |
|                                                                                  |                           | M24   | 24.0      | 3.00      | 14                       | 185          | 555          | 12                       | 160          | 480          | 10                       | 135          | 405          |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  | Aciers<br>500 - 850 N/mm² | M 2   | 2.0       | 0.40      | 7                        | 1115         | 446          | 6                        | 955          | 382          | 5                        | 795          | 318          |
|                                                                                  |                           | M 2.5 | 2.5       | 0.45      | 7                        | 890          | 401          | 6                        | 765          | 344          | 5                        | 635          | 286          |
|                                                                                  |                           | M 3   | 3.0       | 0.50      | 9                        | 955          | 478          | 8                        | 850          | 425          | 7                        | 745          | 373          |
|                                                                                  |                           | M 4   | 4.0       | 0.70      | 9                        | 715          | 500          | 8                        | 635          | 445          | 7                        | 555          | 389          |
|                                                                                  |                           | M 5   | 5.0       | 0.80      | 9                        | 575          | 460          | 8                        | 510          | 408          | 7                        | 445          | 356          |
|                                                                                  |                           | M 6   | 6.0       | 1.00      | 9                        | 475          | 475          | 8                        | 425          | 425          | 7                        | 370          | 370          |
|                                                                                  |                           | M 8   | 8.0       | 1.25      | 9                        | 360          | 450          | 8                        | 320          | 400          | 7                        | 280          | 350          |
|                                                                                  |                           | M10   | 10.0      | 1.50      | 9                        | 285          | 428          | 8                        | 255          | 383          | 7                        | 225          | 338          |
|                                                                                  |                           | M12   | 12.0      | 1.75      | 9                        | 240          | 420          | 8                        | 210          | 368          | 7                        | 185          | 324          |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  | Aciers<br>500 - 850 N/mm² | M16   | 16.0      | 2.00      | 9                        | 180          | 360          | 8                        | 160          | 320          | 7                        | 140          | 280          |
|                                                                                  |                           | M20   | 20.0      | 2.50      | 9                        | 145          | 363          | 8                        | 125          | 313          | 7                        | 110          | 275          |
|                                                                                  |                           | M24   | 24.0      | 3.00      | 9                        | 120          | 360          | 8                        | 105          | 315          | 7                        | 95           | 285          |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |
|                                                                                  |                           |       |           |           |                          |              |              |                          |              |              |                          |              |              |

| Matières                               |       |           |           |                           |                           |                          |                           |                           |                          |                           |                           |                          |  |
|----------------------------------------|-------|-----------|-----------|---------------------------|---------------------------|--------------------------|---------------------------|---------------------------|--------------------------|---------------------------|---------------------------|--------------------------|--|
| Aluminium corroyé<br>Si < 6%<br>trempé | M     | ø<br>[mm] | P<br>[mm] | V <sub>c</sub><br>1.0 x d | n<br>[min <sup>-1</sup> ] | V <sub>f</sub><br>[100%] | V <sub>c</sub><br>1.5 x d | n<br>[min <sup>-1</sup> ] | V <sub>f</sub><br>[100%] | V <sub>c</sub><br>2.0 x d | n<br>[min <sup>-1</sup> ] | V <sub>f</sub><br>[100%] |  |
|                                        | M 2   | 2.0       | 0.40      | 8                         | 1275                      | 510                      | 6                         | 955                       | 382                      | 5                         | 795                       | 318                      |  |
|                                        | M 2.5 | 2.5       | 0.45      | 8                         | 1020                      | 459                      | 6                         | 765                       | 344                      | 5                         | 635                       | 286                      |  |
|                                        | M 3   | 3.0       | 0.50      | 10                        | 1060                      | 530                      | 8                         | 850                       | 425                      | 6                         | 635                       | 318                      |  |
|                                        | M 4   | 4.0       | 0.70      | 10                        | 795                       | 557                      | 8                         | 635                       | 445                      | 6                         | 475                       | 333                      |  |
|                                        | M 5   | 5.0       | 0.80      | 10                        | 635                       | 508                      | 8                         | 510                       | 408                      | 6                         | 380                       | 304                      |  |
|                                        | M 6   | 6.0       | 1.00      | 10                        | 530                       | 530                      | 8                         | 425                       | 425                      | 6                         | 320                       | 320                      |  |
|                                        | M 8   | 8.0       | 1.25      | 10                        | 400                       | 500                      | 8                         | 320                       | 400                      | 6                         | 240                       | 300                      |  |
|                                        | M10   | 10.0      | 1.50      | 10                        | 320                       | 480                      | 8                         | 255                       | 383                      | 6                         | 190                       | 285                      |  |
|                                        | M12   | 12.0      | 1.75      | 10                        | 265                       | 464                      | 8                         | 210                       | 368                      | 6                         | 160                       | 280                      |  |
|                                        | M16   | 16.0      | 2.00      | 10                        | 200                       | 400                      | 8                         | 160                       | 320                      | 6                         | 120                       | 240                      |  |
|                                        | M20   | 20.0      | 2.50      | 10                        | 160                       | 400                      | 8                         | 125                       | 313                      | 6                         | 95                        | 238                      |  |
|                                        | M24   | 24.0      | 3.00      | 10                        | 135                       | 405                      | 8                         | 105                       | 315                      | 6                         | 80                        | 240                      |  |
|                                        |       |           |           |                           |                           |                          |                           |                           |                          |                           |                           |                          |  |
|                                        |       |           |           |                           |                           |                          |                           |                           |                          |                           |                           |                          |  |
|                                        |       |           |           |                           |                           |                          |                           |                           |                          |                           |                           |                          |  |
|                                        |       |           |           |                           |                           |                          |                           |                           |                          |                           |                           |                          |  |
|                                        |       |           |           |                           |                           |                          |                           |                           |                          |                           |                           |                          |  |
| Aciers inoxydables<br>[Cr-Ni/1.4301]   | M 2   | 2.0       | 0.40      | 3                         | 475                       | 190                      | 2                         | 320                       | 128                      | 2                         | 320                       | 128                      |  |
|                                        | M 2.5 | 2.5       | 0.45      | 3                         | 380                       | 171                      | 2                         | 255                       | 115                      | 2                         | 255                       | 115                      |  |
|                                        | M 3   | 3.0       | 0.50      | 4                         | 425                       | 213                      | 3                         | 320                       | 160                      | 3                         | 320                       | 160                      |  |
|                                        | M 4   | 4.0       | 0.70      | 4                         | 320                       | 224                      | 3                         | 240                       | 168                      | 3                         | 240                       | 168                      |  |
|                                        | M 5   | 5.0       | 0.80      | 4                         | 255                       | 204                      | 3                         | 190                       | 152                      | 3                         | 190                       | 152                      |  |
|                                        | M 6   | 6.0       | 1.00      | 4                         | 210                       | 210                      | 3                         | 160                       | 160                      | 3                         | 160                       | 160                      |  |
|                                        | M 8   | 8.0       | 1.25      | 4                         | 160                       | 200                      | 3                         | 120                       | 150                      | 3                         | 120                       | 150                      |  |
|                                        | M10   | 10.0      | 1.50      | 4                         | 125                       | 188                      | 3                         | 95                        | 143                      | 3                         | 95                        | 143                      |  |
|                                        | M12   | 12.0      | 1.75      | 4                         | 105                       | 184                      | 3                         | 80                        | 140                      | 3                         | 80                        | 140                      |  |
|                                        | M16   | 16.0      | 2.00      | 4                         | 80                        | 160                      | 3                         | 60                        | 120                      | 3                         | 60                        | 120                      |  |
|                                        | M20   | 20.0      | 2.50      | 4                         | 65                        | 163                      | 3                         | 50                        | 125                      | 3                         | 50                        | 125                      |  |
|                                        | M24   | 24.0      | 3.00      | 4                         | 55                        | 165                      | 3                         | 40                        | 120                      | 3                         | 40                        | 120                      |  |
|                                        |       |           |           |                           |                           |                          |                           |                           |                          |                           |                           |                          |  |
|                                        |       |           |           |                           |                           |                          |                           |                           |                          |                           |                           |                          |  |
|                                        |       |           |           |                           |                           |                          |                           |                           |                          |                           |                           |                          |  |
|                                        |       |           |           |                           |                           |                          |                           |                           |                          |                           |                           |                          |  |
|                                        |       |           |           |                           |                           |                          |                           |                           |                          |                           |                           |                          |  |

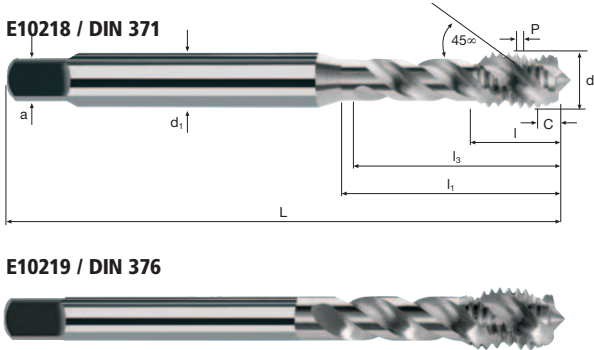


M

7G

HSS-E  
Co5

Form C



Rm  
< 850

Inox  
Stainless

GG(G)  
Aluminium  
Copper

| Exemple: N° cde |       |      |     |      |      |      |      |     |   |        |   | N° d'article |  | Code-ø |  |  |  |
|-----------------|-------|------|-----|------|------|------|------|-----|---|--------|---|--------------|--|--------|--|--|--|
|                 |       |      |     |      |      |      |      |     |   |        |   | E10218       |  | .034   |  |  |  |
| Ø<br>Code       | d     | P    | L   | l    | l1   | l3   | d1   | a   |   | Δ      |   |              |  |        |  |  |  |
| .034            | M 2   | 0.40 | 45  | 8.0  | —    | 10.5 | 2.8  | 2.1 | 3 | +0.030 | ● |              |  |        |  |  |  |
| .040            | M 2.5 | 0.45 | 50  | 9.0  | —    | 13.0 | 2.8  | 2.1 | 3 | +0.030 | ● |              |  |        |  |  |  |
| .044            | M 3   | 0.50 | 56  | 4.0  | 18.0 | 16.0 | 3.5  | 2.7 | 3 | +0.032 | ● |              |  |        |  |  |  |
| .058            | M 4   | 0.70 | 63  | 5.6  | 21.0 | 19.0 | 4.5  | 3.4 | 3 | +0.038 | ● |              |  |        |  |  |  |
| .084            | M 5   | 0.80 | 70  | 6.4  | 25.0 | 23.0 | 6.0  | 4.9 | 3 | +0.040 | ● |              |  |        |  |  |  |
| .088            | M 6   | 1.00 | 80  | 8.0  | 30.0 | 28.0 | 6.0  | 4.9 | 3 | +0.048 | ● |              |  |        |  |  |  |
| .160            | M 8   | 1.25 | 90  | 10.0 | 35.0 | 33.0 | 8.0  | 6.2 | 3 | +0.050 | ● |              |  |        |  |  |  |
| .174            | M10   | 1.50 | 100 | 12.0 | 39.0 | 37.0 | 10.0 | 8.0 | 3 | +0.056 | ● |              |  |        |  |  |  |

| Exemple: N° cde |     |      |     |      |      |      |      |      |   |        |   | N° d'article |  | Code-ø |  |  |  |
|-----------------|-----|------|-----|------|------|------|------|------|---|--------|---|--------------|--|--------|--|--|--|
|                 |     |      |     |      |      |      |      |      |   |        |   | E10219       |  | .240   |  |  |  |
| Ø<br>Code       | d   | P    | L   | l    | l1   | l3   | d1   | a    |   | Δ      |   |              |  |        |  |  |  |
| .240            | M12 | 1.75 | 110 | 14.0 | 50.0 | 48.0 | 9.0  | 7.0  | 3 | +0.064 | ● |              |  |        |  |  |  |
| .246            | M16 | 2.00 | 110 | 16.0 | 58.0 | 56.0 | 12.0 | 9.0  | 4 | +0.068 | ● |              |  |        |  |  |  |
| .314            | M20 | 2.50 | 140 | 20.0 | 72.0 | 70.0 | 16.0 | 12.0 | 4 | +0.072 | ● |              |  |        |  |  |  |
| .320            | M24 | 3.00 | 160 | 24.0 | 74.0 | 72.0 | 18.0 | 14.5 | 4 | +0.085 | ● |              |  |        |  |  |  |
|                 |     |      |     |      |      |      |      |      |   |        |   |              |  |        |  |  |  |
|                 |     |      |     |      |      |      |      |      |   |        |   |              |  |        |  |  |  |
|                 |     |      |     |      |      |      |      |      |   |        |   |              |  |        |  |  |  |
|                 |     |      |     |      |      |      |      |      |   |        |   |              |  |        |  |  |  |

| Application                                                                       | Matières                             | MJ     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |  |
|-----------------------------------------------------------------------------------|--------------------------------------|--------|-----------|-----------|------------------------------------------|---------------------------|-----------------|------------------------------------------|---------------------------|-----------------|--|
|  | Alliages à base nickel<br>non trempé | MJ 2   | 2.0       | 0.40      | 3                                        | 475                       | 190             | 2                                        | 320                       | 128             |  |
|                                                                                   |                                      | MJ 2.5 | 2.5       | 0.45      | 3                                        | 380                       | 171             | 2                                        | 255                       | 115             |  |
|                                                                                   |                                      | MJ 3   | 3.0       | 0.50      | 3                                        | 320                       | 160             | 2                                        | 210                       | 105             |  |
|                                                                                   |                                      | MJ 4   | 4.0       | 0.70      | 3                                        | 240                       | 168             | 2                                        | 160                       | 112             |  |
|                                                                                   |                                      | MJ 5   | 5.0       | 0.80      | 3                                        | 190                       | 152             | 2                                        | 125                       | 100             |  |
|                                                                                   |                                      | MJ 6   | 6.0       | 1.00      | 3                                        | 160                       | 160             | 2                                        | 105                       | 105             |  |
|                                                                                   |                                      | MJ 8   | 8.0       | 1.00      | 3                                        | 120                       | 120             | 2                                        | 80                        | 80              |  |
|                                                                                   |                                      | MJ 8   | 8.0       | 1.25      | 3                                        | 120                       | 150             | 2                                        | 80                        | 100             |  |
|                                                                                   |                                      | MJ 10  | 10.0      | 1.25      | 3                                        | 95                        | 119             | 2                                        | 65                        | 81              |  |
|                                                                                   |                                      | MJ 10  | 10.0      | 1.50      | 3                                        | 95                        | 143             | 2                                        | 65                        | 98              |  |
|  | Alliages à base nickel<br>non trempé |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|  | Alliages à base nickel<br>trempé     | MJ 2   | 2.0       | 0.40      | 2                                        | 320                       | 128             | 2                                        | 320                       | 128             |  |
|                                                                                   |                                      | MJ 2.5 | 2.5       | 0.45      | 2                                        | 255                       | 115             | 2                                        | 255                       | 115             |  |
|                                                                                   |                                      | MJ 3   | 3.0       | 0.50      | 2                                        | 210                       | 105             | 2                                        | 210                       | 105             |  |
|                                                                                   |                                      | MJ 4   | 4.0       | 0.70      | 2                                        | 160                       | 112             | 2                                        | 160                       | 112             |  |
|                                                                                   |                                      | MJ 5   | 5.0       | 0.80      | 2                                        | 125                       | 100             | 2                                        | 125                       | 100             |  |
|                                                                                   |                                      | MJ 6   | 6.0       | 1.00      | 2                                        | 105                       | 105             | 2                                        | 105                       | 105             |  |
|                                                                                   |                                      | MJ 8   | 8.0       | 1.00      | 2                                        | 80                        | 80              | 2                                        | 80                        | 80              |  |
|                                                                                   |                                      | MJ 8   | 8.0       | 1.25      | 2                                        | 80                        | 100             | 2                                        | 80                        | 100             |  |
|                                                                                   |                                      | MJ 10  | 10.0      | 1.25      | 2                                        | 65                        | 81              | 2                                        | 65                        | 81              |  |
|                                                                                   |                                      | MJ 10  | 10.0      | 1.50      | 2                                        | 65                        | 98              | 2                                        | 65                        | 98              |  |
|  | Alliages à base nickel<br>trempé     |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                   |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |

| Application                                                                        | Matières                             | MJ     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |  |
|------------------------------------------------------------------------------------|--------------------------------------|--------|-----------|-----------|------------------------------------------|---------------------------|-----------------|------------------------------------------|---------------------------|-----------------|--|
|  | Alliages à base nickel<br>non trempé | MJ 2   | 2.0       | 0.40      | 3                                        | 475                       | 190             | 2                                        | 320                       | 128             |  |
|                                                                                    |                                      | MJ 2.5 | 2.5       | 0.45      | 3                                        | 380                       | 171             | 2                                        | 255                       | 115             |  |
|                                                                                    |                                      | MJ 3   | 3.0       | 0.50      | 3                                        | 320                       | 160             | 2                                        | 210                       | 105             |  |
|                                                                                    |                                      | MJ 4   | 4.0       | 0.70      | 3                                        | 240                       | 168             | 2                                        | 160                       | 112             |  |
|                                                                                    |                                      | MJ 5   | 5.0       | 0.80      | 3                                        | 190                       | 152             | 2                                        | 125                       | 100             |  |
|                                                                                    |                                      | MJ 6   | 6.0       | 1.00      | 3                                        | 160                       | 160             | 2                                        | 105                       | 105             |  |
|                                                                                    |                                      | MJ 8   | 8.0       | 1.00      | 3                                        | 120                       | 120             | 2                                        | 80                        | 80              |  |
|                                                                                    |                                      | MJ 8   | 8.0       | 1.25      | 3                                        | 120                       | 150             | 2                                        | 80                        | 100             |  |
|                                                                                    |                                      | MJ 10  | 10.0      | 1.25      | 3                                        | 95                        | 119             | 2                                        | 65                        | 81              |  |
|                                                                                    |                                      | MJ 10  | 10.0      | 1.50      | 3                                        | 95                        | 143             | 2                                        | 65                        | 98              |  |
|  | Alliages à base nickel<br>non trempé |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|  | Alliages à base nickel<br>trempé     | MJ 2   | 2.0       | 0.40      | 2                                        | 320                       | 128             | 2                                        | 320                       | 128             |  |
|                                                                                    |                                      | MJ 2.5 | 2.5       | 0.45      | 2                                        | 255                       | 115             | 2                                        | 255                       | 115             |  |
|                                                                                    |                                      | MJ 3   | 3.0       | 0.50      | 2                                        | 210                       | 105             | 2                                        | 210                       | 105             |  |
|                                                                                    |                                      | MJ 4   | 4.0       | 0.70      | 2                                        | 160                       | 112             | 2                                        | 160                       | 112             |  |
|                                                                                    |                                      | MJ 5   | 5.0       | 0.80      | 2                                        | 125                       | 100             | 2                                        | 125                       | 100             |  |
|                                                                                    |                                      | MJ 6   | 6.0       | 1.00      | 2                                        | 105                       | 105             | 2                                        | 105                       | 105             |  |
|                                                                                    |                                      | MJ 8   | 8.0       | 1.00      | 2                                        | 80                        | 80              | 2                                        | 80                        | 80              |  |
|                                                                                    |                                      | MJ 8   | 8.0       | 1.25      | 2                                        | 80                        | 100             | 2                                        | 80                        | 100             |  |
|                                                                                    |                                      | MJ 10  | 10.0      | 1.25      | 2                                        | 65                        | 81              | 2                                        | 65                        | 81              |  |
|                                                                                    |                                      | MJ 10  | 10.0      | 1.50      | 2                                        | 65                        | 98              | 2                                        | 65                        | 98              |  |
|  | Alliages à base nickel<br>trempé     |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |
|                                                                                    |                                      |        |           |           |                                          |                           |                 |                                          |                           |                 |  |







# Filetage métrique pas fin MF

## Tolérance ISO 2 (6H)

N° EH1257 / EH1258 x-tap



N° EH1260 / EH1261 x-tap



N° EH6910 / EH6911



N° ET1240 / ET1241 Inotap



N° ET1260 / ET1261 x-tap



N° EH1270 / EH1271



N° EH1229 polytap-R



|  |             |  |                    |                   |     |
|--|-------------|--|--------------------|-------------------|-----|
|  | HSS<br>PM/F |  | Rm<br>850-1100     |                   | 247 |
|  | HSS<br>PM/F |  | Rm<br>850-1100     |                   | 251 |
|  | HM<br>MG10  |  | HRC<br>48- >60     |                   | 255 |
|  | HSS<br>PM/F |  | Inox<br>Stainless  |                   | 257 |
|  | HSS<br>PM/F |  | Inox<br>Stainless  |                   | 261 |
|  | HSS<br>PM/F |  | GG(G)<br>Cast iron |                   | 265 |
|  | HSS<br>PM/F |  | Rm<br><850-1100    | Inox<br>Stainless | 269 |

MF

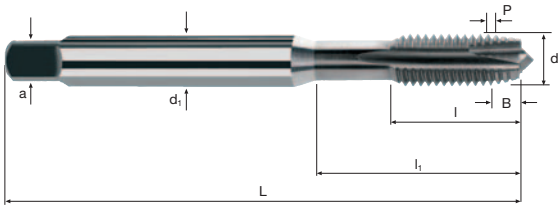


MF

ISO 2  
(6H)

HSS  
PM/F

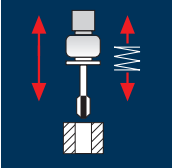
X - P  
Form B



MF

|             |                |                 |  |  |  |  |  |  |  |  |
|-------------|----------------|-----------------|--|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  |  |  |  |  |
|-------------|----------------|-----------------|--|--|--|--|--|--|--|--|

| Exemple: N° cde      N° d'article      Code-ø<br><b>EH1257</b> <b>.029</b> |       |      |     |    |    |      |     |   |      | TiCN          |
|----------------------------------------------------------------------------|-------|------|-----|----|----|------|-----|---|------|---------------|
|                                                                            |       |      |     |    |    |      |     |   |      | <b>EH1257</b> |
| Ø<br>Code                                                                  | d     | P    | L   | I  | I1 | d1   | a   |   |      |               |
| .029                                                                       | M 2.5 | 0.35 | 50  | 9  | —  | 2.8  | 2.1 | 2 | 2.15 | ●             |
| .031                                                                       | M 3   | 0.35 | 56  | 12 | 18 | 3.5  | 2.7 | 3 | 2.65 | ●             |
| .032                                                                       | M 3.5 | 0.35 | 56  | 12 | 20 | 4.0  | 3.0 | 3 | 3.15 | ●             |
| .046                                                                       | M 4   | 0.50 | 63  | 13 | 21 | 4.5  | 3.4 | 3 | 3.50 | ●             |
| .048                                                                       | M 5   | 0.50 | 70  | 15 | 25 | 6.0  | 4.9 | 3 | 4.50 | ●             |
| .050                                                                       | M 6   | 0.50 | 80  | 17 | 30 | 6.0  | 4.9 | 3 | 5.50 | ●             |
| .052                                                                       | M 8   | 0.50 | 90  | 20 | 35 | 8.0  | 6.2 | 3 | 7.50 | ●             |
| .054                                                                       | M10   | 0.50 | 100 | 22 | 39 | 10.0 | 8.0 | 3 | 9.50 | ●             |
| .064                                                                       | M 6   | 0.75 | 80  | 17 | 30 | 6.0  | 4.9 | 3 | 5.20 | ●             |
| .065                                                                       | M 7   | 0.75 | 80  | 17 | 30 | 7.0  | 5.5 | 3 | 6.20 | ●             |
| .066                                                                       | M 8   | 0.75 | 90  | 20 | 35 | 8.0  | 6.2 | 3 | 7.20 | ●             |
| .068                                                                       | M10   | 0.75 | 100 | 22 | 39 | 10.0 | 8.0 | 3 | 9.20 | ●             |
| .090                                                                       | M 8   | 1.00 | 90  | 20 | 35 | 8.0  | 6.2 | 3 | 7.00 | ●             |
| .091                                                                       | M 9   | 1.00 | 90  | 20 | 35 | 9.0  | 7.0 | 3 | 8.00 | ●             |
| .092                                                                       | M10   | 1.00 | 100 | 22 | 39 | 10.0 | 8.0 | 3 | 9.00 | ●             |
| .162                                                                       | M10   | 1.25 | 100 | 22 | 39 | 10.0 | 8.0 | 3 | 8.80 | ●             |
| Dimensions plus grandes voir N° d'article EH1258, page 249                 |       |      |     |    |    |      |     |   |      |               |

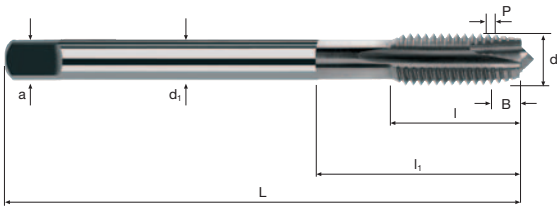
| Application                                                                         | Matières                                | MF  | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>3.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] |
|-------------------------------------------------------------------------------------|-----------------------------------------|-----|-----------|-----------|------------------------------------------|---------------------------|-----------------|------------------------------------------|---------------------------|-----------------|------------------------------------------|---------------------------|-----------------|
|     | Aciers<br>500 - 850 N/mm <sup>2</sup>   | M12 | 12.0      | 0.75      | 25                                       | 665                       | 499             | 20                                       | 530                       | 398             | 15                                       | 400                       | 300             |
|                                                                                     |                                         | M14 | 14.0      | 0.75      | 25                                       | 570                       | 428             | 20                                       | 455                       | 341             | 15                                       | 340                       | 255             |
|                                                                                     |                                         | M16 | 16.0      | 0.75      | 25                                       | 495                       | 371             | 20                                       | 400                       | 300             | 15                                       | 300                       | 225             |
|                                                                                     |                                         | M12 | 12.0      | 1.00      | 25                                       | 665                       | 665             | 20                                       | 530                       | 530             | 15                                       | 400                       | 400             |
|                                                                                     |                                         | M13 | 13.0      | 1.00      | 25                                       | 610                       | 610             | 20                                       | 490                       | 490             | 15                                       | 365                       | 365             |
|                                                                                     |                                         | M14 | 14.0      | 1.00      | 25                                       | 570                       | 570             | 20                                       | 455                       | 455             | 15                                       | 340                       | 340             |
|                                                                                     |                                         | M16 | 16.0      | 1.00      | 25                                       | 495                       | 495             | 20                                       | 400                       | 400             | 15                                       | 300                       | 300             |
|                                                                                     |                                         | M18 | 18.0      | 1.00      | 25                                       | 440                       | 440             | 20                                       | 355                       | 355             | 15                                       | 265                       | 265             |
|                                                                                     |                                         | M20 | 20.0      | 1.00      | 25                                       | 400                       | 400             | 20                                       | 320                       | 320             | 15                                       | 240                       | 240             |
|                                                                                     | Aciers<br>500 - 850 N/mm <sup>2</sup>   | M12 | 12.0      | 1.25      | 25                                       | 665                       | 831             | 20                                       | 530                       | 663             | 15                                       | 400                       | 500             |
|                                                                                     |                                         | M14 | 14.0      | 1.25      | 25                                       | 570                       | 713             | 20                                       | 455                       | 569             | 15                                       | 340                       | 425             |
|                                                                                     |                                         | M16 | 16.0      | 1.25      | 25                                       | 495                       | 619             | 20                                       | 400                       | 500             | 15                                       | 300                       | 375             |
|                                                                                     |                                         | M12 | 12.0      | 1.50      | 25                                       | 665                       | 998             | 20                                       | 530                       | 795             | 15                                       | 400                       | 600             |
|                                                                                     |                                         | M14 | 14.0      | 1.50      | 25                                       | 570                       | 855             | 20                                       | 455                       | 683             | 15                                       | 340                       | 510             |
|                                                                                     |                                         | M16 | 16.0      | 1.50      | 25                                       | 495                       | 743             | 20                                       | 400                       | 600             | 15                                       | 300                       | 450             |
|                                                                                     |                                         | M18 | 18.0      | 1.50      | 25                                       | 440                       | 660             | 20                                       | 355                       | 533             | 15                                       | 265                       | 398             |
|                                                                                     |                                         | M20 | 20.0      | 1.50      | 25                                       | 400                       | 600             | 20                                       | 320                       | 480             | 15                                       | 240                       | 360             |
|                                                                                     | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | M24 | 24.0      | 1.50      | 25                                       | 330                       | 495             | 20                                       | 265                       | 398             | 15                                       | 200                       | 300             |
|                                                                                     |                                         | M12 | 12.0      | 0.75      | 20                                       | 530                       | 398             | 15                                       | 400                       | 300             | 12                                       | 320                       | 240             |
|                                                                                     |                                         | M14 | 14.0      | 0.75      | 20                                       | 455                       | 341             | 15                                       | 340                       | 255             | 12                                       | 275                       | 206             |
|                                                                                     |                                         | M16 | 16.0      | 0.75      | 20                                       | 400                       | 300             | 15                                       | 300                       | 225             | 12                                       | 240                       | 180             |
|                                                                                     |                                         | M12 | 12.0      | 1.00      | 20                                       | 530                       | 530             | 15                                       | 400                       | 400             | 12                                       | 320                       | 320             |
|                                                                                     |                                         | M13 | 13.0      | 1.00      | 20                                       | 490                       | 490             | 15                                       | 365                       | 365             | 12                                       | 295                       | 295             |
|                                                                                     |                                         | M14 | 14.0      | 1.00      | 20                                       | 455                       | 455             | 15                                       | 340                       | 340             | 12                                       | 275                       | 275             |
|                                                                                     |                                         | M16 | 16.0      | 1.00      | 20                                       | 400                       | 400             | 15                                       | 300                       | 300             | 12                                       | 240                       | 240             |
|                                                                                     | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | M18 | 18.0      | 1.00      | 20                                       | 355                       | 355             | 15                                       | 265                       | 265             | 12                                       | 210                       | 210             |
|                                                                                     |                                         | M20 | 20.0      | 1.00      | 20                                       | 320                       | 320             | 15                                       | 240                       | 240             | 12                                       | 190                       | 190             |
|                                                                                     |                                         | M12 | 12.0      | 1.25      | 20                                       | 530                       | 663             | 15                                       | 400                       | 500             | 12                                       | 320                       | 400             |
|                                                                                     |                                         | M14 | 14.0      | 1.25      | 20                                       | 455                       | 569             | 15                                       | 340                       | 425             | 12                                       | 275                       | 344             |
|                                                                                     |                                         | M16 | 16.0      | 1.25      | 20                                       | 400                       | 500             | 15                                       | 300                       | 375             | 12                                       | 240                       | 300             |
|                                                                                     |                                         | M12 | 12.0      | 1.50      | 20                                       | 530                       | 795             | 15                                       | 400                       | 600             | 12                                       | 320                       | 480             |
|                                                                                     |                                         | M14 | 14.0      | 1.50      | 20                                       | 455                       | 683             | 15                                       | 340                       | 510             | 12                                       | 275                       | 413             |
|                                                                                     |                                         | M16 | 16.0      | 1.50      | 20                                       | 400                       | 600             | 15                                       | 300                       | 450             | 12                                       | 240                       | 360             |
|  | Aciers<br>1100 - 1300 N/mm <sup>2</sup> | M18 | 18.0      | 1.50      | 20                                       | 355                       | 533             | 15                                       | 265                       | 398             | 12                                       | 210                       | 315             |
|                                                                                     |                                         | M20 | 20.0      | 1.50      | 20                                       | 320                       | 480             | 15                                       | 240                       | 360             | 12                                       | 190                       | 285             |
|                                                                                     |                                         | M24 | 24.0      | 1.50      | 20                                       | 265                       | 398             | 15                                       | 200                       | 300             | 12                                       | 160                       | 240             |
|                                                                                     |                                         | M12 | 12.0      | 0.75      | 7                                        | 185                       | 139             | 4                                        | 105                       | 79              |                                          |                           |                 |
|                                                                                     |                                         | M14 | 14.0      | 0.75      | 7                                        | 160                       | 120             | 4                                        | 90                        | 68              |                                          |                           |                 |
|                                                                                     |                                         | M16 | 16.0      | 0.75      | 7                                        | 140                       | 105             | 4                                        | 80                        | 60              |                                          |                           |                 |
|                                                                                     |                                         | M12 | 12.0      | 1.00      | 7                                        | 185                       | 185             | 4                                        | 105                       | 105             |                                          |                           |                 |
|                                                                                     |                                         | M13 | 13.0      | 1.00      | 7                                        | 170                       | 170             | 4                                        | 100                       | 100             |                                          |                           |                 |
|                                                                                     | Aciers<br>1100 - 1300 N/mm <sup>2</sup> | M14 | 14.0      | 1.00      | 7                                        | 160                       | 160             | 4                                        | 90                        | 90              |                                          |                           |                 |
|                                                                                     |                                         | M16 | 16.0      | 1.00      | 7                                        | 140                       | 140             | 4                                        | 80                        | 80              |                                          |                           |                 |
|                                                                                     |                                         | M18 | 18.0      | 1.00      | 7                                        | 125                       | 125             | 4                                        | 70                        | 70              |                                          |                           |                 |
|                                                                                     |                                         | M20 | 20.0      | 1.00      | 7                                        | 110                       | 110             | 4                                        | 65                        | 65              |                                          |                           |                 |
|                                                                                     |                                         | M12 | 12.0      | 1.25      | 7                                        | 185                       | 231             | 4                                        | 105                       | 131             |                                          |                           |                 |
|                                                                                     |                                         | M14 | 14.0      | 1.25      | 7                                        | 160                       | 200             | 4                                        | 90                        | 113             |                                          |                           |                 |
|                                                                                     |                                         | M16 | 16.0      | 1.25      | 7                                        | 140                       | 175             | 4                                        | 80                        | 100             |                                          |                           |                 |
|                                                                                     |                                         | M12 | 12.0      | 1.50      | 7                                        | 185                       | 278             | 4                                        | 105                       | 158             |                                          |                           |                 |
|                                                                                     |                                         | M14 | 14.0      | 1.50      | 7                                        | 160                       | 240             | 4                                        | 90                        | 135             |                                          |                           |                 |
|                                                                                     |                                         | M16 | 16.0      | 1.50      | 7                                        | 140                       | 210             | 4                                        | 80                        | 120             |                                          |                           |                 |
|                                                                                     |                                         | M18 | 18.0      | 1.50      | 7                                        | 125                       | 188             | 4                                        | 70                        | 105             |                                          |                           |                 |
|                                                                                     |                                         | M20 | 20.0      | 1.50      | 7                                        | 110                       | 165             | 4                                        | 65                        | 98              |                                          |                           |                 |
|                                                                                     |                                         | M24 | 24.0      | 1.50      | 7                                        | 95                        | 143             | 4                                        | 55                        | 83              |                                          |                           |                 |
|                                                                                     |                                         |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                     |                                         |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                     |                                         |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                     |                                         |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                     |                                         |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                     |                                         |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                     |                                         |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                     |                                         |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |

MF

ISO 2  
(6H)

HSS  
PM/F

Form B

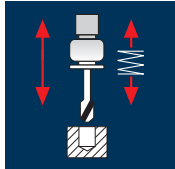


MF

|             |                |                 |  |  |  |  |  |  |  |  |
|-------------|----------------|-----------------|--|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  |  |  |  |  |
|-------------|----------------|-----------------|--|--|--|--|--|--|--|--|

| Exemple: N° cde     |     |      |     |    |    |      |      |   |       | TiCN   |   |
|---------------------|-----|------|-----|----|----|------|------|---|-------|--------|---|
| N° d'article Code-ø |     |      |     |    |    |      |      |   |       | EH1258 |   |
| Ø<br>Code           | d   | P    | L   | l  | l1 | d1   | a    |   |       |        |   |
| .070                | M12 | 0.75 | 100 | 18 | 39 | 9.0  | 7.0  | 3 | 11.30 |        | ● |
| .072                | M14 | 0.75 | 100 | 18 | 39 | 11.0 | 9.0  | 3 | 13.30 |        | ● |
| .074                | M16 | 0.75 | 100 | 18 | 39 | 12.0 | 9.0  | 3 | 15.30 |        | ● |
| .094                | M12 | 1.00 | 100 | 18 | 39 | 9.0  | 7.0  | 3 | 11.00 |        | ● |
| .095                | M13 | 1.00 | 100 | 18 | 39 | 11.0 | 7.0  | 3 | 12.00 |        | ● |
| .096                | M14 | 1.00 | 100 | 18 | 39 | 11.0 | 9.0  | 3 | 13.00 |        | ● |
| .097                | M15 | 1.00 | 100 | 18 | 39 | 12.0 | 9.0  | 3 | 14.00 |        | ● |
| .098                | M16 | 1.00 | 100 | 18 | 39 | 12.0 | 9.0  | 3 | 15.00 |        | ● |
| .099                | M17 | 1.00 | 100 | 18 | 39 | 12.0 | 9.0  | 4 | 16.00 |        | ● |
| .100                | M18 | 1.00 | 110 | 20 | 45 | 14.0 | 11.0 | 4 | 17.00 |        | ● |
| .102                | M20 | 1.00 | 125 | 20 | 50 | 16.0 | 12.0 | 4 | 19.00 |        | ● |
| .164                | M12 | 1.25 | 100 | 22 | 39 | 9.0  | 7.0  | 3 | 10.80 |        | ● |
| .166                | M14 | 1.25 | 100 | 22 | 39 | 11.0 | 9.0  | 3 | 12.80 |        | ● |
| .168                | M16 | 1.25 | 100 | 22 | 39 | 12.0 | 9.0  | 3 | 14.80 |        | ● |
| .176                | M12 | 1.50 | 100 | 22 | 39 | 9.0  | 7.0  | 3 | 10.50 |        | ● |
| .178                | M14 | 1.50 | 100 | 22 | 39 | 11.0 | 9.0  | 3 | 12.50 |        | ● |
| .180                | M16 | 1.50 | 100 | 22 | 39 | 12.0 | 9.0  | 3 | 14.50 |        | ● |
| .182                | M18 | 1.50 | 110 | 22 | 45 | 14.0 | 11.0 | 4 | 16.50 |        | ● |
| .184                | M20 | 1.50 | 125 | 25 | 50 | 16.0 | 12.0 | 4 | 18.50 |        | ● |
| .186                | M22 | 1.50 | 125 | 26 | 50 | 18.0 | 14.5 | 4 | 20.50 |        | ● |
| .188                | M24 | 1.50 | 140 | 27 | 52 | 18.0 | 14.5 | 4 | 22.50 |        | ● |
|                     |     |      |     |    |    |      |      |   |       |        |   |
|                     |     |      |     |    |    |      |      |   |       |        |   |

## Application



## Matières

Aciers  
500 - 850 N/mm<sup>2</sup>

Aciers  
500 - 850 N/mm<sup>2</sup>

Aciers  
850 - 1100 N/mm<sup>2</sup>

Aciers  
850 - 1100 N/mm<sup>2</sup>

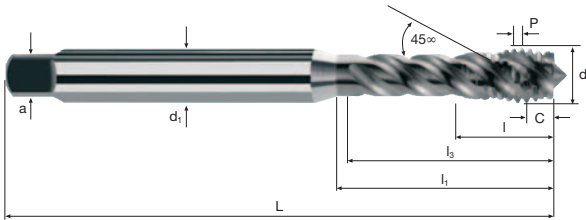
| MF    | ø    | P    | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  |
|-------|------|------|----------------|----------------------|--------|----------------|----------------------|--------|----------------|----------------------|--------|
|       | [mm] | [mm] | $1.0 \times d$ | [min <sup>-1</sup> ] | [100%] | $1.5 \times d$ | [min <sup>-1</sup> ] | [100%] | $2.0 \times d$ | [min <sup>-1</sup> ] | [100%] |
| M 2.5 | 2.5  | 0.35 | 32             | 4075                 | 1426   | 28             | 3565                 | 1248   | 22             | 2800                 | 980    |
| M 3   | 3.0  | 0.35 | 32             | 3395                 | 1188   | 28             | 2970                 | 1040   | 22             | 2335                 | 817    |
| M 3.5 | 3.5  | 0.35 | 32             | 2910                 | 1018   | 28             | 2545                 | 891    | 22             | 2000                 | 700    |
| M 4   | 4.0  | 0.50 | 32             | 2545                 | 1273   | 28             | 2230                 | 1115   | 22             | 1750                 | 875    |
| M 5   | 5.0  | 0.50 | 32             | 2035                 | 1018   | 28             | 1785                 | 893    | 22             | 1400                 | 700    |
| M 6   | 6.0  | 0.50 | 32             | 1700                 | 850    | 28             | 1485                 | 743    | 22             | 1165                 | 583    |
| M 8   | 8.0  | 0.50 | 32             | 1275                 | 638    | 28             | 1115                 | 558    | 22             | 875                  | 438    |
| M10   | 10.0 | 0.50 | 32             | 1020                 | 510    | 28             | 890                  | 445    | 22             | 700                  | 350    |
| M 6   | 6.0  | 0.75 | 32             | 1700                 | 1275   | 28             | 1485                 | 1114   | 22             | 1165                 | 874    |
| M 7   | 7.0  | 0.75 | 32             | 1455                 | 1091   | 28             | 1275                 | 956    | 22             | 1000                 | 750    |
| M 8   | 8.0  | 0.75 | 32             | 1275                 | 956    | 28             | 1115                 | 836    | 22             | 875                  | 656    |
| M10   | 10.0 | 0.75 | 32             | 1020                 | 765    | 28             | 890                  | 668    | 22             | 700                  | 525    |
| M 8   | 8.0  | 1.00 | 32             | 1275                 | 1275   | 28             | 1115                 | 1115   | 22             | 875                  | 875    |
| M 9   | 9.0  | 1.00 | 32             | 1130                 | 1130   | 28             | 990                  | 990    | 22             | 780                  | 780    |
| M10   | 10.0 | 1.00 | 32             | 1020                 | 1020   | 28             | 890                  | 890    | 22             | 700                  | 700    |
| M10   | 10.0 | 1.25 | 32             | 1020                 | 1275   | 28             | 890                  | 1113   | 22             | 700                  | 875    |
| M 2.5 | 2.5  | 0.35 | 20             | 2545                 | 891    | 16             | 2035                 | 712    | 10             | 1275                 | 446    |
| M 3   | 3.0  | 0.35 | 20             | 2120                 | 742    | 16             | 1700                 | 595    | 10             | 1060                 | 371    |
| M 3.5 | 3.5  | 0.35 | 20             | 1820                 | 637    | 16             | 1455                 | 509    | 10             | 910                  | 319    |
| M 4   | 4.0  | 0.50 | 20             | 1590                 | 795    | 16             | 1275                 | 638    | 10             | 795                  | 398    |
| M 5   | 5.0  | 0.50 | 20             | 1275                 | 638    | 16             | 1020                 | 510    | 10             | 635                  | 318    |
| M 6   | 6.0  | 0.50 | 20             | 1060                 | 530    | 16             | 850                  | 425    | 10             | 530                  | 265    |
| M 8   | 8.0  | 0.50 | 20             | 795                  | 398    | 16             | 635                  | 318    | 10             | 400                  | 200    |
| M10   | 10.0 | 0.50 | 20             | 635                  | 318    | 16             | 510                  | 255    | 10             | 320                  | 160    |
| M 6   | 6.0  | 0.75 | 20             | 1060                 | 795    | 16             | 850                  | 638    | 10             | 530                  | 398    |
| M 7   | 7.0  | 0.75 | 20             | 910                  | 683    | 16             | 730                  | 548    | 10             | 455                  | 341    |
| M 8   | 8.0  | 0.75 | 20             | 795                  | 596    | 16             | 635                  | 476    | 10             | 400                  | 300    |
| M10   | 10.0 | 0.75 | 20             | 635                  | 476    | 16             | 510                  | 383    | 10             | 320                  | 240    |
| M 8   | 8.0  | 1.00 | 20             | 795                  | 795    | 16             | 635                  | 635    | 10             | 400                  | 400    |
| M 9   | 9.0  | 1.00 | 20             | 705                  | 705    | 16             | 565                  | 565    | 10             | 355                  | 355    |
| M10   | 10.0 | 1.00 | 20             | 635                  | 635    | 16             | 510                  | 510    | 10             | 320                  | 320    |
| M10   | 10.0 | 1.25 | 20             | 635                  | 794    | 16             | 510                  | 638    | 10             | 320                  | 400    |

MF

ISO 2  
(6H)

HSS  
PM/F

Form C



MF

|             |                |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|

| Exemple: N° cde      N° d'article      Code-ø<br>EH1260      .029 |       |      |     |    |    |    |      |     |   |      | TiCN   |
|-------------------------------------------------------------------|-------|------|-----|----|----|----|------|-----|---|------|--------|
|                                                                   |       |      |     |    |    |    |      |     |   |      | EH1260 |
| Ø<br>Code                                                         | d     | P    | L   | l  | l1 | l3 | d1   | a   |   |      |        |
| .029                                                              | M 2.5 | 0.35 | 50  | 9  | —  | 13 | 2.8  | 2.1 | 3 | 2.15 | ●      |
| .031                                                              | M 3   | 0.35 | 56  | 5  | 18 | 16 | 3.5  | 2.7 | 3 | 2.65 | ●      |
| .032                                                              | M 3.5 | 0.35 | 56  | 6  | 20 | 18 | 4.0  | 3.0 | 3 | 3.15 | ●      |
| .046                                                              | M 4   | 0.50 | 63  | 7  | 21 | 19 | 4.5  | 3.4 | 3 | 3.50 | ●      |
| .048                                                              | M 5   | 0.50 | 70  | 8  | 25 | 23 | 6.0  | 4.9 | 3 | 4.50 | ●      |
| .050                                                              | M 6   | 0.50 | 80  | 10 | 30 | 28 | 6.0  | 4.9 | 3 | 5.50 | ●      |
| .052                                                              | M 8   | 0.50 | 90  | 13 | 35 | 33 | 8.0  | 6.2 | 3 | 7.50 | ●      |
| .054                                                              | M10   | 0.50 | 100 | 15 | 39 | 37 | 10.0 | 8.0 | 4 | 9.50 | ●      |
| .064                                                              | M 6   | 0.75 | 80  | 10 | 30 | 28 | 6.0  | 4.9 | 3 | 5.20 | ●      |
| .065                                                              | M 7   | 0.75 | 80  | 10 | 30 | 28 | 7.0  | 5.5 | 3 | 6.20 | ●      |
| .066                                                              | M 8   | 0.75 | 90  | 13 | 35 | 33 | 8.0  | 6.2 | 3 | 7.20 | ●      |
| .068                                                              | M10   | 0.75 | 100 | 15 | 39 | 37 | 10.0 | 8.0 | 4 | 9.20 | ●      |
| .090                                                              | M 8   | 1.00 | 90  | 13 | 35 | 33 | 8.0  | 6.2 | 3 | 7.00 | ●      |
| .091                                                              | M 9   | 1.00 | 90  | 13 | 35 | 33 | 9.0  | 7.0 | 3 | 8.00 | ●      |
| .092                                                              | M10   | 1.00 | 100 | 15 | 39 | 37 | 10.0 | 8.0 | 4 | 9.00 | ●      |
| .162                                                              | M10   | 1.25 | 100 | 15 | 39 | 37 | 10.0 | 8.0 | 4 | 8.80 | ●      |
| Dimensions plus grandes voir N° d'article EH1261, page 253        |       |      |     |    |    |    |      |     |   |      |        |

| Application                            | Matières                               |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|----------------------------------------|----------------------------------------|-----|-----------|-----------|------------------------------------------|---------------------------|-----------------|------------------------------------------|---------------------------|-----------------|------------------------------------------|---------------------------|-----------------|
|                                        | Aciers<br>500 - 850 N/mm <sup>2</sup>  | MF  | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] |
|                                        |                                        | M12 | 12.0      | 0.75      | 32                                       | 850                       | 638             | 28                                       | 745                       | 559             | 22                                       | 585                       | 439             |
|                                        |                                        | M14 | 14.0      | 0.75      | 32                                       | 730                       | 548             | 28                                       | 635                       | 476             | 22                                       | 500                       | 375             |
|                                        |                                        | M16 | 16.0      | 0.75      | 32                                       | 635                       | 476             | 28                                       | 555                       | 416             | 22                                       | 440                       | 330             |
|                                        |                                        | M12 | 12.0      | 1.00      | 32                                       | 850                       | 850             | 28                                       | 745                       | 745             | 22                                       | 585                       | 585             |
|                                        |                                        | M13 | 13.0      | 1.00      | 32                                       | 785                       | 785             | 28                                       | 685                       | 685             | 22                                       | 540                       | 540             |
|                                        |                                        | M14 | 14.0      | 1.00      | 32                                       | 730                       | 730             | 28                                       | 635                       | 635             | 22                                       | 500                       | 500             |
|                                        |                                        | M15 | 15.0      | 1.00      | 32                                       | 680                       | 680             | 28                                       | 595                       | 595             | 22                                       | 465                       | 465             |
|                                        |                                        | M16 | 16.0      | 1.00      | 32                                       | 635                       | 635             | 28                                       | 555                       | 555             | 22                                       | 440                       | 440             |
|                                        |                                        | M17 | 17.0      | 1.00      | 32                                       | 600                       | 600             | 28                                       | 525                       | 525             | 22                                       | 410                       | 410             |
|                                        | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M18 | 18.0      | 1.00      | 32                                       | 565                       | 565             | 28                                       | 495                       | 495             | 22                                       | 390                       | 390             |
|                                        |                                        | M20 | 20.0      | 1.00      | 32                                       | 510                       | 510             | 28                                       | 445                       | 445             | 22                                       | 350                       | 350             |
|                                        |                                        | M12 | 12.0      | 1.25      | 32                                       | 850                       | 1063            | 28                                       | 745                       | 931             | 22                                       | 585                       | 731             |
|                                        |                                        | M14 | 14.0      | 1.25      | 32                                       | 730                       | 913             | 28                                       | 635                       | 794             | 22                                       | 500                       | 625             |
|                                        |                                        | M16 | 16.0      | 1.25      | 32                                       | 635                       | 794             | 28                                       | 555                       | 694             | 22                                       | 440                       | 550             |
|                                        |                                        | M12 | 12.0      | 1.50      | 32                                       | 850                       | 1275            | 28                                       | 745                       | 1118            | 22                                       | 585                       | 878             |
|                                        |                                        | M14 | 14.0      | 1.50      | 32                                       | 730                       | 1095            | 28                                       | 635                       | 953             | 22                                       | 500                       | 750             |
|                                        |                                        | M16 | 16.0      | 1.50      | 32                                       | 635                       | 953             | 28                                       | 555                       | 833             | 22                                       | 440                       | 660             |
|                                        |                                        | M18 | 18.0      | 1.50      | 32                                       | 565                       | 848             | 28                                       | 495                       | 743             | 22                                       | 390                       | 585             |
|                                        |                                        | M20 | 20.0      | 1.50      | 32                                       | 510                       | 765             | 28                                       | 445                       | 668             | 22                                       | 350                       | 525             |
|                                        | Aciers<br>500 - 850 N/mm <sup>2</sup>  | M22 | 22.0      | 1.50      | 32                                       | 465                       | 698             | 28                                       | 405                       | 608             | 22                                       | 320                       | 480             |
|                                        |                                        | M24 | 24.0      | 1.50      | 32                                       | 425                       | 638             | 28                                       | 370                       | 555             | 22                                       | 290                       | 435             |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
| Matières                               |                                        | MF  | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] |
| Aciers<br>850 - 1100 N/mm <sup>2</sup> |                                        | M12 | 12.0      | 0.75      | 20                                       | 530                       | 398             | 16                                       | 425                       | 319             | 10                                       | 265                       | 199             |
|                                        |                                        | M14 | 14.0      | 0.75      | 20                                       | 455                       | 341             | 16                                       | 365                       | 274             | 10                                       | 225                       | 169             |
|                                        |                                        | M16 | 16.0      | 0.75      | 20                                       | 400                       | 300             | 16                                       | 320                       | 240             | 10                                       | 200                       | 150             |
|                                        |                                        | M12 | 12.0      | 1.00      | 20                                       | 530                       | 530             | 16                                       | 425                       | 425             | 10                                       | 265                       | 265             |
|                                        |                                        | M13 | 13.0      | 1.00      | 20                                       | 490                       | 490             | 16                                       | 390                       | 390             | 10                                       | 245                       | 245             |
|                                        |                                        | M14 | 14.0      | 1.00      | 20                                       | 455                       | 455             | 16                                       | 365                       | 365             | 10                                       | 225                       | 225             |
|                                        |                                        | M15 | 15.0      | 1.00      | 20                                       | 425                       | 425             | 16                                       | 340                       | 340             | 10                                       | 210                       | 210             |
|                                        |                                        | M16 | 16.0      | 1.00      | 20                                       | 400                       | 400             | 16                                       | 320                       | 320             | 10                                       | 200                       | 200             |
|                                        |                                        | M17 | 17.0      | 1.00      | 20                                       | 375                       | 375             | 16                                       | 300                       | 300             | 10                                       | 185                       | 185             |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        | Aciers<br>850 - 1100 N/mm <sup>2</sup> | M18 | 18.0      | 1.00      | 20                                       | 355                       | 355             | 16                                       | 285                       | 285             | 10                                       | 175                       | 175             |
|                                        |                                        | M20 | 20.0      | 1.00      | 20                                       | 320                       | 320             | 16                                       | 255                       | 255             | 10                                       | 160                       | 160             |
|                                        |                                        | M12 | 12.0      | 1.25      | 20                                       | 530                       | 663             | 16                                       | 425                       | 531             | 10                                       | 265                       | 331             |
|                                        |                                        | M14 | 14.0      | 1.25      | 20                                       | 455                       | 569             | 16                                       | 365                       | 456             | 10                                       | 225                       | 281             |
|                                        |                                        | M16 | 16.0      | 1.25      | 20                                       | 400                       | 500             | 16                                       | 320                       | 400             | 10                                       | 200                       | 250             |
|                                        |                                        | M12 | 12.0      | 1.50      | 20                                       | 530                       | 795             | 16                                       | 425                       | 638             | 10                                       | 265                       | 398             |
|                                        |                                        | M14 | 14.0      | 1.50      | 20                                       | 455                       | 683             | 16                                       | 365                       | 548             | 10                                       | 225                       | 338             |
|                                        |                                        | M16 | 16.0      | 1.50      | 20                                       | 400                       | 600             | 16                                       | 320                       | 480             | 10                                       | 200                       | 300             |
|                                        |                                        | M18 | 18.0      | 1.50      | 20                                       | 355                       | 533             | 16                                       | 285                       | 428             | 10                                       | 175                       | 263             |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        | Aciers<br>850 - 1100 N/mm <sup>2</sup> | M20 | 20.0      | 1.50      | 20                                       | 320                       | 480             | 16                                       | 255                       | 383             | 10                                       | 160                       | 240             |
|                                        |                                        | M22 | 22.0      | 1.50      | 20                                       | 290                       | 435             | 16                                       | 230                       | 345             | 10                                       | 145                       | 218             |
|                                        |                                        | M24 | 24.0      | 1.50      | 20                                       | 265                       | 398             | 16                                       | 210                       | 315             | 10                                       | 135                       | 203             |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |
|                                        |                                        |     |           |           |                                          |                           |                 |                                          |                           |                 |                                          |                           |                 |



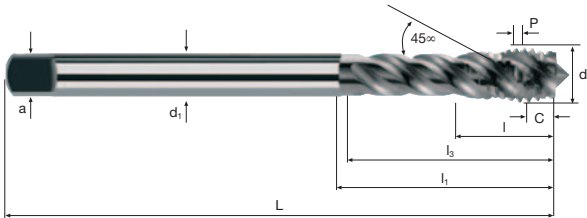
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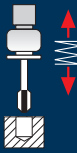
Form C



MF

|             |                |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|

| Exemple: N° cde      N° d'article      Code-ø<br><b>EH1261</b> <b>.070</b> |     |      |     |    |    |    |      |      |                                                                                   |                                                                                   | TiCN          |
|----------------------------------------------------------------------------|-----|------|-----|----|----|----|------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------|
|                                                                            |     |      |     |    |    |    |      |      |                                                                                   |                                                                                   | <b>EH1261</b> |
| Ø<br>Code                                                                  | d   | P    | L   | l  | l1 | l3 | d1   | a    |  |  |               |
| .070                                                                       | M12 | 0.75 | 100 | 11 | 39 | 37 | 9.0  | 7.0  | 4                                                                                 | 11.30                                                                             | ●             |
| .072                                                                       | M14 | 0.75 | 100 | 11 | 39 | 37 | 11.0 | 9.0  | 4                                                                                 | 13.30                                                                             | ●             |
| .074                                                                       | M16 | 0.75 | 100 | 12 | 39 | 37 | 12.0 | 9.0  | 4                                                                                 | 15.30                                                                             | ●             |
| .094                                                                       | M12 | 1.00 | 100 | 11 | 39 | 37 | 9.0  | 7.0  | 4                                                                                 | 11.00                                                                             | ●             |
| .095                                                                       | M13 | 1.00 | 100 | 11 | 39 | 37 | 11.0 | 9.0  | 4                                                                                 | 12.00                                                                             | ●             |
| .096                                                                       | M14 | 1.00 | 100 | 11 | 39 | 37 | 11.0 | 9.0  | 4                                                                                 | 13.00                                                                             | ●             |
| .097                                                                       | M15 | 1.00 | 100 | 12 | 39 | 37 | 12.0 | 9.0  | 4                                                                                 | 14.00                                                                             | ●             |
| .098                                                                       | M16 | 1.00 | 100 | 12 | 39 | 37 | 12.0 | 9.0  | 4                                                                                 | 15.00                                                                             | ●             |
| .099                                                                       | M17 | 1.00 | 100 | 12 | 39 | 37 | 12.0 | 9.0  | 4                                                                                 | 16.00                                                                             | ●             |
| .100                                                                       | M18 | 1.00 | 110 | 13 | 50 | 48 | 14.0 | 11.0 | 4                                                                                 | 17.00                                                                             | ●             |
| .102                                                                       | M20 | 1.00 | 125 | 14 | 65 | 63 | 16.0 | 12.0 | 4                                                                                 | 19.00                                                                             | ●             |
| .164                                                                       | M12 | 1.25 | 100 | 15 | 39 | 37 | 9.0  | 7.0  | 4                                                                                 | 10.80                                                                             | ●             |
| .166                                                                       | M14 | 1.25 | 100 | 15 | 39 | 37 | 11.0 | 9.0  | 4                                                                                 | 12.80                                                                             | ●             |
| .168                                                                       | M16 | 1.25 | 100 | 15 | 39 | 37 | 12.0 | 9.0  | 4                                                                                 | 14.80                                                                             | ●             |
| .176                                                                       | M12 | 1.50 | 100 | 15 | 39 | 37 | 9.0  | 7.0  | 4                                                                                 | 10.50                                                                             | ●             |
| .178                                                                       | M14 | 1.50 | 100 | 15 | 39 | 37 | 11.0 | 9.0  | 4                                                                                 | 12.50                                                                             | ●             |
| .180                                                                       | M16 | 1.50 | 100 | 15 | 39 | 37 | 12.0 | 9.0  | 4                                                                                 | 14.50                                                                             | ●             |
| .182                                                                       | M18 | 1.50 | 110 | 17 | 50 | 48 | 14.0 | 11.0 | 4                                                                                 | 16.50                                                                             | ●             |
| .184                                                                       | M20 | 1.50 | 125 | 18 | 65 | 63 | 16.0 | 12.0 | 4                                                                                 | 18.50                                                                             | ●             |
| .186                                                                       | M22 | 1.50 | 125 | 18 | 65 | 63 | 18.0 | 14.5 | 5                                                                                 | 20.50                                                                             | ●             |
| .188                                                                       | M24 | 1.50 | 140 | 20 | 72 | 70 | 18.0 | 14.5 | 5                                                                                 | 22.50                                                                             | ●             |
|                                                                            |     |      |     |    |    |    |      |      |                                                                                   |                                                                                   |               |
|                                                                            |     |      |     |    |    |    |      |      |                                                                                   |                                                                                   |               |

| Application                                                                       | Matières                                                                                                                                                            |  |  |  |  |  |  |  |  |  |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
|  | Aciers à outil trempés<br>48 - 52 HRC                                                                                                                               |  |  |  |  |  |  |  |  |  |
|                                                                                   |   |  |  |  |  |  |  |  |  |  |
|                                                                                   | Aciers à outil trempés<br>52 - 56 HRC                                                                                                                               |  |  |  |  |  |  |  |  |  |
|                                                                                   |   |  |  |  |  |  |  |  |  |  |
|                                                                                   | Aciers à outil trempés<br>56 - 60 HRC                                                                                                                               |  |  |  |  |  |  |  |  |  |
|                                                                                   |   |  |  |  |  |  |  |  |  |  |
|                                                                                   | Aciers à outil trempés<br>> 60 HRC                                                                                                                                  |  |  |  |  |  |  |  |  |  |
|                                                                                   |   |  |  |  |  |  |  |  |  |  |

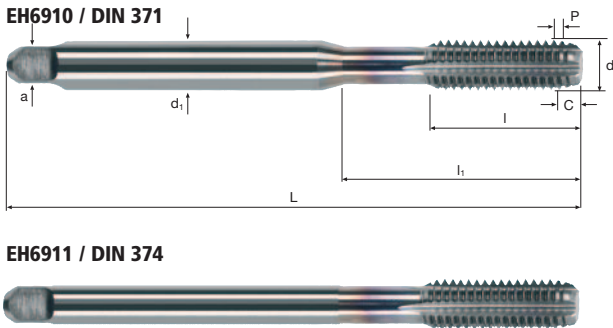
| Application                                                                        | Matières                                                                                                                                                                |  |  |  |  |  |  |  |  |  |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
|  | Aciers à outil trempés<br>48 - 52 HRC                                                                                                                                   |  |  |  |  |  |  |  |  |  |
|                                                                                    |   |  |  |  |  |  |  |  |  |  |
|                                                                                    | Aciers à outil trempés<br>52 - 56 HRC                                                                                                                                   |  |  |  |  |  |  |  |  |  |
|                                                                                    |   |  |  |  |  |  |  |  |  |  |
|                                                                                    | Aciers à outil trempés<br>56 - 60 HRC                                                                                                                                   |  |  |  |  |  |  |  |  |  |
|                                                                                    |   |  |  |  |  |  |  |  |  |  |
|                                                                                    | Aciers à outil trempés<br>> 60 HRC                                                                                                                                      |  |  |  |  |  |  |  |  |  |
|                                                                                    |   |  |  |  |  |  |  |  |  |  |



MF

ISO 2  
(6H)

HM  
MG10



MF

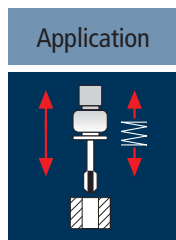
HRC  
48-56

HRC  
56-60

HRC  
> 60

| Exemple: N° cde |     |      |     |    |    |      |     |   |        | TiCN   |
|-----------------|-----|------|-----|----|----|------|-----|---|--------|--------|
| N° d'article    |     |      |     |    |    |      |     |   |        | EH6910 |
| Code-ø          |     |      |     |    |    |      |     |   |        |        |
| Ø<br>Code       | d   | P    | L   | l  | l1 | d1   | a   |   |        |        |
| .050            | M 6 | 0.50 | 80  | 17 | 30 | 6.0  | 4.9 | 4 | 5.60 * | ●      |
| .090            | M 8 | 1.00 | 90  | 20 | 35 | 8.0  | 6.2 | 5 | 7.10   | ●      |
| .092            | M10 | 1.00 | 100 | 22 | 39 | 10.0 | 8.0 | 5 | 9.10   | ●      |
|                 |     |      |     |    |    |      |     |   |        |        |
|                 |     |      |     |    |    |      |     |   |        |        |
|                 |     |      |     |    |    |      |     |   |        |        |
|                 |     |      |     |    |    |      |     |   |        |        |
|                 |     |      |     |    |    |      |     |   |        |        |

| Exemple: N° cde                      |     |      |     |    |    |    |     |   |         | TiCN   |
|--------------------------------------|-----|------|-----|----|----|----|-----|---|---------|--------|
| N° d'article                         |     |      |     |    |    |    |     |   |         | EH6911 |
| Code-ø                               |     |      |     |    |    |    |     |   |         |        |
| Ø<br>Code                            | d   | P    | L   | l  | l1 | d1 | a   |   |         |        |
| .176                                 | M12 | 1.50 | 100 | 22 | 39 | 9  | 7.0 | 5 | 10.70 * | ●      |
| .178                                 | M14 | 1.50 | 100 | 22 | 39 | 11 | 9.0 | 5 | 12.70 * | ●      |
| .180                                 | M16 | 1.50 | 100 | 22 | 39 | 12 | 9.0 | 5 | 14.70 * | ●      |
|                                      |     |      |     |    |    |    |     |   |         |        |
|                                      |     |      |     |    |    |    |     |   |         |        |
|                                      |     |      |     |    |    |    |     |   |         |        |
|                                      |     |      |     |    |    |    |     |   |         |        |
| * La dimension donnée est hors norme |     |      |     |    |    |    |     |   |         |        |



**Application**

**Matières**

Aciers inoxydables  
ferritique/martensitique

Aciers inoxydables  
ferritique/martensitique

Aciers inoxydables  
[Cr-Ni/1.4301]

Aciers inoxydables  
[Cr-Ni/1.4301]

| MF    | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-------|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
| M 2.5 | 2.5       | 0.35      | 12               | 1530                      | 536             | 10               | 1275                      | 446             | 8                | 1020                      | 357             |
| M 3   | 3.0       | 0.35      | 12               | 1275                      | 446             | 10               | 1060                      | 371             | 8                | 850                       | 298             |
| M 3.5 | 3.5       | 0.35      | 12               | 1090                      | 382             | 10               | 910                       | 319             | 8                | 730                       | 255             |
| M 4   | 4.0       | 0.50      | 12               | 955                       | 478             | 10               | 795                       | 398             | 8                | 635                       | 318             |
| M 5   | 5.0       | 0.50      | 12               | 765                       | 383             | 10               | 635                       | 318             | 8                | 510                       | 255             |
| M 6   | 6.0       | 0.50      | 12               | 635                       | 318             | 10               | 530                       | 265             | 8                | 425                       | 213             |
| M 8   | 8.0       | 0.50      | 12               | 475                       | 238             | 10               | 400                       | 200             | 8                | 320                       | 160             |
| M10   | 10.0      | 0.50      | 12               | 380                       | 190             | 10               | 320                       | 160             | 8                | 255                       | 128             |
| M 6   | 6.0       | 0.75      | 12               | 635                       | 476             | 10               | 530                       | 398             | 8                | 425                       | 319             |
| M 7   | 7.0       | 0.75      | 12               | 545                       | 409             | 10               | 455                       | 341             | 8                | 365                       | 274             |
| M 8   | 8.0       | 0.75      | 12               | 475                       | 356             | 10               | 400                       | 300             | 8                | 320                       | 240             |
| M10   | 10.0      | 0.75      | 12               | 380                       | 285             | 10               | 320                       | 240             | 8                | 255                       | 191             |
| M 8   | 8.0       | 1.00      | 12               | 475                       | 475             | 10               | 400                       | 400             | 8                | 320                       | 320             |
| M 9   | 9.0       | 1.00      | 12               | 425                       | 425             | 10               | 355                       | 355             | 8                | 285                       | 285             |
| M10   | 10.0      | 1.00      | 12               | 380                       | 380             | 10               | 320                       | 320             | 8                | 255                       | 255             |
| M10   | 10.0      | 1.25      | 12               | 380                       | 475             | 10               | 320                       | 400             | 8                | 255                       | 319             |

|       |      |      |   |     |     |   |     |     |   |     |     |
|-------|------|------|---|-----|-----|---|-----|-----|---|-----|-----|
| M 2.5 | 2.5  | 0.35 | 7 | 890 | 312 | 5 | 635 | 222 | 4 | 510 | 179 |
| M 3   | 3.0  | 0.35 | 7 | 745 | 261 | 5 | 530 | 186 | 4 | 425 | 149 |
| M 3.5 | 3.5  | 0.35 | 7 | 635 | 222 | 5 | 455 | 159 | 4 | 365 | 128 |
| M 4   | 4.0  | 0.50 | 7 | 555 | 278 | 5 | 400 | 200 | 4 | 320 | 160 |
| M 5   | 5.0  | 0.50 | 7 | 445 | 223 | 5 | 320 | 160 | 4 | 255 | 128 |
| M 6   | 6.0  | 0.50 | 7 | 370 | 185 | 5 | 265 | 133 | 4 | 210 | 105 |
| M 8   | 8.0  | 0.50 | 7 | 280 | 140 | 5 | 200 | 100 | 4 | 160 | 80  |
| M10   | 10.0 | 0.50 | 7 | 225 | 113 | 5 | 160 | 80  | 4 | 125 | 63  |
| M 6   | 6.0  | 0.75 | 7 | 370 | 278 | 5 | 265 | 199 | 4 | 210 | 158 |
| M 7   | 7.0  | 0.75 | 7 | 320 | 240 | 5 | 225 | 169 | 4 | 180 | 135 |
| M 8   | 8.0  | 0.75 | 7 | 280 | 210 | 5 | 200 | 150 | 4 | 160 | 120 |
| M10   | 10.0 | 0.75 | 7 | 225 | 169 | 5 | 160 | 120 | 4 | 125 | 94  |
| M 8   | 8.0  | 1.00 | 7 | 280 | 280 | 5 | 200 | 200 | 4 | 160 | 160 |
| M 9   | 9.0  | 1.00 | 7 | 250 | 250 | 5 | 175 | 175 | 4 | 140 | 140 |
| M10   | 10.0 | 1.00 | 7 | 225 | 225 | 5 | 160 | 160 | 4 | 125 | 125 |
| M10   | 10.0 | 1.25 | 7 | 225 | 281 | 5 | 160 | 200 | 4 | 125 | 156 |

**Matières**

Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]

Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]

Aciers réfractaires  
[17-4 PH]

Aciers réfractaires  
[17-4 PH]

| MF    | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-------|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
| M 2.5 | 2.5       | 0.35      | 8                | 1020                      | 357             | 6                | 765                       | 268             | 5                | 635                       | 222             |
| M 3   | 3.0       | 0.35      | 8                | 850                       | 298             | 6                | 635                       | 222             | 5                | 530                       | 186             |
| M 3.5 | 3.5       | 0.35      | 8                | 730                       | 255             | 6                | 545                       | 191             | 5                | 455                       | 159             |
| M 4   | 4.0       | 0.50      | 8                | 635                       | 318             | 6                | 475                       | 238             | 5                | 400                       | 200             |
| M 5   | 5.0       | 0.50      | 8                | 510                       | 255             | 6                | 380                       | 190             | 5                | 320                       | 160             |
| M 6   | 6.0       | 0.50      | 8                | 425                       | 213             | 6                | 320                       | 160             | 5                | 265                       | 133             |
| M 8   | 8.0       | 0.50      | 8                | 320                       | 160             | 6                | 240                       | 120             | 5                | 200                       | 100             |
| M10   | 10.0      | 0.50      | 8                | 255                       | 128             | 6                | 190                       | 95              | 5                | 160                       | 80              |
| M 6   | 6.0       | 0.75      | 8                | 425                       | 319             | 6                | 320                       | 240             | 5                | 265                       | 199             |
| M 7   | 7.0       | 0.75      | 8                | 365                       | 274             | 6                | 275                       | 206             | 5                | 225                       | 169             |
| M 8   | 8.0       | 0.75      | 8                | 320                       | 240             | 6                | 240                       | 180             | 5                | 200                       | 150             |
| M10   | 10.0      | 0.75      | 8                | 255                       | 191             | 6                | 190                       | 143             | 5                | 160                       | 120             |
| M 8   | 8.0       | 1.00      | 8                | 320                       | 320             | 6                | 240                       | 240             | 5                | 200                       | 200             |
| M 9   | 9.0       | 1.00      | 8                | 285                       | 285             | 6                | 210                       | 210             | 5                | 175                       | 175             |
| M10   | 10.0      | 1.00      | 8                | 255                       | 255             | 6                | 190                       | 190             | 5                | 160                       | 160             |
| M10   | 10.0      | 1.25      | 8                | 255                       | 319             | 6                | 190                       | 238             | 5                | 160                       | 200             |

|       |      |      |   |     |     |   |     |     |   |     |     |
|-------|------|------|---|-----|-----|---|-----|-----|---|-----|-----|
| M 2.5 | 2.5  | 0.35 | 5 | 635 | 222 | 4 | 510 | 179 | 3 | 380 | 133 |
| M 3   | 3.0  | 0.35 | 5 | 530 | 186 | 4 | 425 | 149 | 3 | 320 | 112 |
| M 3.5 | 3.5  | 0.35 | 5 | 455 | 159 | 4 | 365 | 128 | 3 | 275 | 96  |
| M 4   | 4.0  | 0.50 | 5 | 400 | 200 | 4 | 320 | 160 | 3 | 240 | 120 |
| M 5   | 5.0  | 0.50 | 5 | 320 | 160 | 4 | 255 | 128 | 3 | 190 | 95  |
| M 6   | 6.0  | 0.50 | 5 | 265 | 133 | 4 | 210 | 105 | 3 | 160 | 80  |
| M 8   | 8.0  | 0.50 | 5 | 200 | 100 | 4 | 160 | 80  | 3 | 120 | 60  |
| M10   | 10.0 | 0.50 | 5 | 160 | 80  | 4 | 125 | 63  | 3 | 95  | 48  |
| M 6   | 6.0  | 0.75 | 5 | 265 | 199 | 4 | 210 | 158 | 3 | 160 | 120 |
| M 7   | 7.0  | 0.75 | 5 | 225 | 169 | 4 | 180 | 135 | 3 | 135 | 101 |
| M 8   | 8.0  | 0.75 | 5 | 200 | 150 | 4 | 160 | 120 | 3 | 120 | 90  |
| M10   | 10.0 | 0.75 | 5 | 160 | 120 | 4 | 125 | 94  | 3 | 95  | 71  |
| M 8   | 8.0  | 1.00 | 5 | 200 | 200 | 4 | 160 | 160 | 3 | 120 | 120 |
| M 9   | 9.0  | 1.00 | 5 | 175 | 175 | 4 | 140 | 140 | 3 | 105 | 105 |
| M10   | 10.0 | 1.00 | 5 | 160 | 160 | 4 | 125 | 125 | 3 | 95  | 95  |
| M10   | 10.0 | 1.25 | 5 | 160 | 200 | 4 | 125 | 156 | 3 | 95  | 119 |

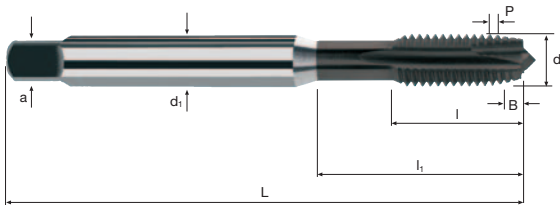


MF

ISO 2  
(6H)

HSS  
PM/F

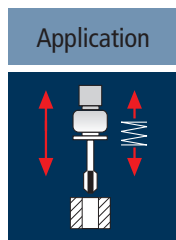
Form B



MF

Inox  
Stainless

| Exemple: N° cde                                            |       |      |     |    |    |      |     |   |        | TRIBO  |
|------------------------------------------------------------|-------|------|-----|----|----|------|-----|---|--------|--------|
| N° d'article                                               |       |      |     |    |    |      |     |   |        | ET1240 |
| Code-ø                                                     |       |      |     |    |    |      |     |   |        |        |
| Ø<br>Code                                                  | d     | P    | L   | l  | l1 | d1   | a   |   |        |        |
| .029                                                       | M 2.5 | 0.35 | 50  | 9  | —  | 2.8  | 2.1 | 2 | 2.20   | ●      |
| .031                                                       | M 3   | 0.35 | 56  | 12 | 18 | 3.5  | 2.7 | 3 | 2.70   | ●      |
| .032                                                       | M 3.5 | 0.35 | 56  | 12 | 20 | 4.0  | 3.0 | 3 | 3.20   | ●      |
| .046                                                       | M 4   | 0.50 | 63  | 13 | 21 | 4.5  | 3.4 | 3 | 3.60 * | ●      |
| .048                                                       | M 5   | 0.50 | 70  | 15 | 25 | 6.0  | 4.9 | 3 | 4.60 * | ●      |
| .050                                                       | M 6   | 0.50 | 80  | 17 | 30 | 6.0  | 4.9 | 3 | 5.60 * | ●      |
| .052                                                       | M 8   | 0.50 | 90  | 20 | 35 | 8.0  | 6.2 | 3 | 7.60 * | ●      |
| .054                                                       | M10   | 0.50 | 100 | 22 | 39 | 10.0 | 8.0 | 3 | 9.60 * | ●      |
| .064                                                       | M 6   | 0.75 | 80  | 17 | 30 | 6.0  | 4.9 | 3 | 5.30   | ●      |
| .065                                                       | M 7   | 0.75 | 80  | 17 | 30 | 7.0  | 5.5 | 3 | 6.30   | ●      |
| .066                                                       | M 8   | 0.75 | 90  | 20 | 35 | 8.0  | 6.2 | 3 | 7.30   | ●      |
| .068                                                       | M10   | 0.75 | 100 | 22 | 39 | 10.0 | 8.0 | 3 | 9.30   | ●      |
| .090                                                       | M 8   | 1.00 | 90  | 20 | 35 | 8.0  | 6.2 | 3 | 7.10   | ●      |
| .091                                                       | M 9   | 1.00 | 90  | 20 | 35 | 9.0  | 7.0 | 3 | 8.10   | ●      |
| .092                                                       | M10   | 1.00 | 100 | 22 | 39 | 10.0 | 8.0 | 3 | 9.10   | ●      |
| .162                                                       | M10   | 1.25 | 100 | 22 | 39 | 10.0 | 8.0 | 3 | 8.90   | ●      |
| * La dimension donnée est hors norme                       |       |      |     |    |    |      |     |   |        |        |
| Dimensions plus grandes voir N° d'article ET1241, page 259 |       |      |     |    |    |      |     |   |        |        |



**Application**

**Matières**

Aciers inoxydables  
ferritique/martensitique



Aciers inoxydables  
ferritique/martensitique



Aciers inoxydables  
[Cr-Ni/1.4301]



Aciers inoxydables  
[Cr-Ni/1.4301]



| MF  | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-----|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
| M12 | 12.0      | 0.75      | 12               | 320                       | 240             | 10               | 265                       | 199             | 8                | 210                       | 158             |
| M14 | 14.0      | 0.75      | 12               | 275                       | 206             | 10               | 225                       | 169             | 8                | 180                       | 135             |
| M16 | 16.0      | 0.75      | 12               | 240                       | 180             | 10               | 200                       | 150             | 8                | 160                       | 120             |
| M12 | 12.0      | 1.00      | 12               | 320                       | 320             | 10               | 265                       | 265             | 8                | 210                       | 210             |
| M13 | 13.0      | 1.00      | 12               | 295                       | 295             | 10               | 245                       | 245             | 8                | 195                       | 195             |
| M14 | 14.0      | 1.00      | 12               | 275                       | 275             | 10               | 225                       | 225             | 8                | 180                       | 180             |
| M16 | 16.0      | 1.00      | 12               | 240                       | 240             | 10               | 200                       | 200             | 8                | 160                       | 160             |
| M18 | 18.0      | 1.00      | 12               | 210                       | 210             | 10               | 175                       | 175             | 8                | 140                       | 140             |
| M20 | 20.0      | 1.00      | 12               | 190                       | 190             | 10               | 160                       | 160             | 8                | 125                       | 125             |
| M12 | 12.0      | 1.25      | 12               | 320                       | 400             | 10               | 265                       | 331             | 8                | 210                       | 263             |
| M14 | 14.0      | 1.25      | 12               | 275                       | 344             | 10               | 225                       | 281             | 8                | 180                       | 225             |
| M16 | 16.0      | 1.25      | 12               | 240                       | 300             | 10               | 200                       | 250             | 8                | 160                       | 200             |
| M12 | 12.0      | 1.50      | 12               | 320                       | 480             | 10               | 265                       | 398             | 8                | 210                       | 315             |
| M14 | 14.0      | 1.50      | 12               | 275                       | 413             | 10               | 225                       | 338             | 8                | 180                       | 270             |
| M16 | 16.0      | 1.50      | 12               | 240                       | 360             | 10               | 200                       | 300             | 8                | 160                       | 240             |
| M18 | 18.0      | 1.50      | 12               | 210                       | 315             | 10               | 175                       | 263             | 8                | 140                       | 210             |
| M20 | 20.0      | 1.50      | 12               | 190                       | 285             | 10               | 160                       | 240             | 8                | 125                       | 188             |
| M24 | 24.0      | 1.50      | 12               | 160                       | 240             | 10               | 135                       | 203             | 8                | 105                       | 158             |
| M12 | 12.0      | 0.75      | 7                | 185                       | 139             | 5                | 135                       | 101             | 4                | 105                       | 79              |
| M14 | 14.0      | 0.75      | 7                | 160                       | 120             | 5                | 115                       | 86              | 4                | 90                        | 68              |
| M16 | 16.0      | 0.75      | 7                | 140                       | 105             | 5                | 100                       | 75              | 4                | 80                        | 60              |
| M12 | 12.0      | 1.00      | 7                | 185                       | 185             | 5                | 135                       | 135             | 4                | 105                       | 105             |
| M13 | 13.0      | 1.00      | 7                | 170                       | 170             | 5                | 120                       | 120             | 4                | 100                       | 100             |
| M14 | 14.0      | 1.00      | 7                | 160                       | 160             | 5                | 115                       | 115             | 4                | 90                        | 90              |
| M16 | 16.0      | 1.00      | 7                | 140                       | 140             | 5                | 100                       | 100             | 4                | 80                        | 80              |
| M18 | 18.0      | 1.00      | 7                | 125                       | 125             | 5                | 90                        | 90              | 4                | 70                        | 70              |
| M20 | 20.0      | 1.00      | 7                | 110                       | 110             | 5                | 80                        | 80              | 4                | 65                        | 65              |
| M12 | 12.0      | 1.25      | 7                | 185                       | 231             | 5                | 135                       | 169             | 4                | 105                       | 131             |
| M14 | 14.0      | 1.25      | 7                | 160                       | 200             | 5                | 115                       | 144             | 4                | 90                        | 113             |
| M16 | 16.0      | 1.25      | 7                | 140                       | 175             | 5                | 100                       | 125             | 4                | 80                        | 100             |
| M12 | 12.0      | 1.50      | 7                | 185                       | 278             | 5                | 135                       | 203             | 4                | 105                       | 158             |
| M14 | 14.0      | 1.50      | 7                | 160                       | 240             | 5                | 115                       | 173             | 4                | 90                        | 135             |
| M16 | 16.0      | 1.50      | 7                | 140                       | 210             | 5                | 100                       | 150             | 4                | 80                        | 120             |
| M18 | 18.0      | 1.50      | 7                | 125                       | 188             | 5                | 90                        | 135             | 4                | 70                        | 105             |
| M20 | 20.0      | 1.50      | 7                | 110                       | 165             | 5                | 80                        | 120             | 4                | 65                        | 98              |
| M24 | 24.0      | 1.50      | 7                | 95                        | 143             | 5                | 65                        | 98              | 4                | 55                        | 83              |

**Matières**

Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers réfractaires  
[17-4 PH]



Aciers réfractaires  
[17-4 PH]



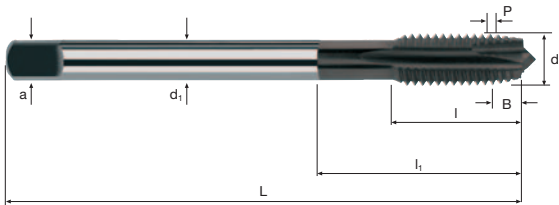
| MF  | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-----|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
| M12 | 12.0      | 0.75      | 8                | 210                       | 158             | 6                | 160                       | 120             | 5                | 135                       | 101             |
| M14 | 14.0      | 0.75      | 8                | 180                       | 135             | 6                | 135                       | 101             | 5                | 115                       | 86              |
| M16 | 16.0      | 0.75      | 8                | 160                       | 120             | 6                | 120                       | 90              | 5                | 100                       | 75              |
| M12 | 12.0      | 1.00      | 8                | 210                       | 210             | 6                | 160                       | 160             | 5                | 135                       | 135             |
| M13 | 13.0      | 1.00      | 8                | 195                       | 195             | 6                | 145                       | 145             | 5                | 120                       | 120             |
| M14 | 14.0      | 1.00      | 8                | 180                       | 180             | 6                | 135                       | 135             | 5                | 115                       | 115             |
| M16 | 16.0      | 1.00      | 8                | 160                       | 160             | 6                | 120                       | 120             | 5                | 100                       | 100             |
| M18 | 18.0      | 1.00      | 8                | 140                       | 140             | 6                | 105                       | 105             | 5                | 90                        | 90              |
| M20 | 20.0      | 1.00      | 8                | 125                       | 125             | 6                | 95                        | 95              | 5                | 80                        | 80              |
| M12 | 12.0      | 1.25      | 8                | 210                       | 263             | 6                | 160                       | 200             | 5                | 135                       | 169             |
| M14 | 14.0      | 1.25      | 8                | 180                       | 225             | 6                | 135                       | 169             | 5                | 115                       | 144             |
| M16 | 16.0      | 1.25      | 8                | 160                       | 200             | 6                | 120                       | 150             | 5                | 100                       | 125             |
| M12 | 12.0      | 1.50      | 8                | 210                       | 315             | 6                | 160                       | 240             | 5                | 135                       | 203             |
| M14 | 14.0      | 1.50      | 8                | 180                       | 270             | 6                | 135                       | 203             | 5                | 115                       | 173             |
| M16 | 16.0      | 1.50      | 8                | 160                       | 240             | 6                | 120                       | 180             | 5                | 100                       | 150             |
| M18 | 18.0      | 1.50      | 8                | 140                       | 210             | 6                | 105                       | 158             | 5                | 90                        | 135             |
| M20 | 20.0      | 1.50      | 8                | 125                       | 188             | 6                | 95                        | 143             | 5                | 80                        | 120             |
| M24 | 24.0      | 1.50      | 8                | 105                       | 158             | 6                | 80                        | 120             | 5                | 65                        | 98              |
| M12 | 12.0      | 0.75      | 5                | 135                       | 101             | 4                | 105                       | 79              | 3                | 80                        | 60              |
| M14 | 14.0      | 0.75      | 5                | 115                       | 86              | 4                | 90                        | 68              | 3                | 70                        | 53              |
| M16 | 16.0      | 0.75      | 5                | 100                       | 75              | 4                | 80                        | 60              | 3                | 60                        | 45              |
| M12 | 12.0      | 1.00      | 5                | 135                       | 135             | 4                | 105                       | 105             | 3                | 80                        | 80              |
| M13 | 13.0      | 1.00      | 5                | 120                       | 120             | 4                | 100                       | 100             | 3                | 75                        | 75              |
| M14 | 14.0      | 1.00      | 5                | 115                       | 115             | 4                | 90                        | 90              | 3                | 70                        | 70              |
| M16 | 16.0      | 1.00      | 5                | 100                       | 100             | 4                | 80                        | 80              | 3                | 60                        | 60              |
| M18 | 18.0      | 1.00      | 5                | 90                        | 90              | 4                | 70                        | 70              | 3                | 55                        | 55              |
| M20 | 20.0      | 1.00      | 5                | 80                        | 80              | 4                | 65                        | 65              | 3                | 50                        | 50              |
| M12 | 12.0      | 1.25      | 5                | 135                       | 169             | 4                | 105                       | 131             | 3                | 80                        | 100             |
| M14 | 14.0      | 1.25      | 5                | 115                       | 144             | 4                | 90                        | 113             | 3                | 70                        | 88              |
| M16 | 16.0      | 1.25      | 5                | 100                       | 125             | 4                | 80                        | 100             | 3                | 60                        | 75              |
| M12 | 12.0      | 1.50      | 5                | 135                       | 203             | 4                | 105                       | 158             | 3                | 80                        | 120             |
| M14 | 14.0      | 1.50      | 5                | 115                       | 173             | 4                | 90                        | 135             | 3                | 70                        | 105             |
| M16 | 16.0      | 1.50      | 5                | 100                       | 150             | 4                | 80                        | 120             | 3                | 60                        | 90              |
| M18 | 18.0      | 1.50      | 5                | 90                        | 135             | 4                | 70                        | 105             | 3                | 55                        | 83              |
| M20 | 20.0      | 1.50      | 5                | 80                        | 120             | 4                | 65                        | 98              | 3                | 50                        | 75              |
| M24 | 24.0      | 1.50      | 5                | 65                        | 98              | 4                | 55                        | 83              | 3                | 40                        | 60              |



MF

ISO 2  
(6H)

HSS  
PM/F



MF

Inox  
Stainless

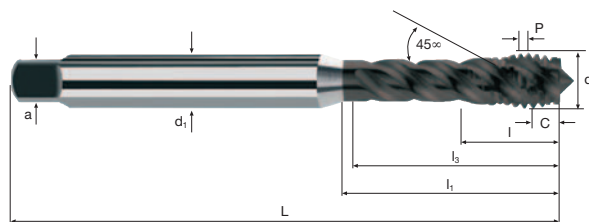
| Exemple: N° cde                      |     |      |     |    |                |                |      |   |         | TRIBO  |   |
|--------------------------------------|-----|------|-----|----|----------------|----------------|------|---|---------|--------|---|
| N° d'article                         |     |      |     |    |                |                |      |   |         | ET1241 |   |
| Code-ø                               |     |      |     |    |                |                |      |   |         |        |   |
| Ø<br>Code                            | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a    |   |         |        |   |
| .070                                 | M12 | 0.75 | 100 | 18 | 39             | 9.0            | 7.0  | 3 | 11.40 * |        | ● |
| .072                                 | M14 | 0.75 | 100 | 18 | 39             | 11.0           | 9.0  | 3 | 13.40 * |        | ● |
| .074                                 | M16 | 0.75 | 100 | 18 | 39             | 12.0           | 9.0  | 3 | 15.40 * |        | ● |
| .094                                 | M12 | 1.00 | 100 | 18 | 39             | 9.0            | 7.0  | 3 | 11.10   |        | ● |
| .095                                 | M13 | 1.00 | 100 | 18 | 39             | 11.0           | 9.0  | 3 | 12.10   |        | ● |
| .096                                 | M14 | 1.00 | 100 | 18 | 39             | 11.0           | 9.0  | 3 | 13.10   |        | ● |
| .097                                 | M15 | 1.00 | 100 | 18 | 39             | 12.0           | 9.0  | 3 | 14.10   |        | ● |
| .098                                 | M16 | 1.00 | 100 | 18 | 39             | 12.0           | 9.0  | 3 | 15.10   |        | ● |
| .099                                 | M17 | 1.00 | 100 | 18 | 39             | 12.0           | 9.0  | 4 | 16.10   |        | ● |
| .100                                 | M18 | 1.00 | 110 | 20 | 45             | 14.0           | 11.0 | 4 | 17.10   |        | ● |
| .102                                 | M20 | 1.00 | 125 | 20 | 50             | 16.0           | 12.0 | 4 | 19.10   |        | ● |
| .164                                 | M12 | 1.25 | 100 | 22 | 39             | 9.0            | 7.0  | 3 | 10.90   |        | ● |
| .166                                 | M14 | 1.25 | 100 | 22 | 39             | 11.0           | 9.0  | 3 | 12.90   |        | ● |
| .168                                 | M16 | 1.25 | 100 | 22 | 39             | 12.0           | 9.0  | 3 | 14.90   |        | ● |
| .176                                 | M12 | 1.50 | 100 | 22 | 39             | 9.0            | 7.0  | 3 | 10.70   |        | ● |
| .178                                 | M14 | 1.50 | 100 | 22 | 39             | 11.0           | 9.0  | 3 | 12.70   |        | ● |
| .180                                 | M16 | 1.50 | 100 | 22 | 39             | 12.0           | 9.0  | 3 | 14.70   |        | ● |
| .182                                 | M18 | 1.50 | 110 | 25 | 45             | 14.0           | 11.0 | 4 | 16.70   |        | ● |
| .184                                 | M20 | 1.50 | 125 | 26 | 50             | 16.0           | 12.0 | 4 | 18.70   |        | ● |
| .186                                 | M22 | 1.50 | 125 | 26 | 50             | 18.0           | 14.5 | 4 | 20.70   |        | ● |
| .188                                 | M24 | 1.50 | 140 | 27 | 52             | 18.0           | 14.5 | 4 | 22.70   |        | ● |
| * La dimension donnée est hors norme |     |      |     |    |                |                |      |   |         |        |   |







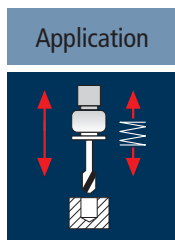
**ISO 2**  
**(6H)**



MF

**Inox**  
Stainless

[www.fraisa.com](http://www.fraisa.com)



| Application | Matières                                       |
|-------------|------------------------------------------------|
|             | Aciers inoxydables<br>ferritique/martensitique |
|             |                                                |

|  |                                                |
|--|------------------------------------------------|
|  | Aciers inoxydables<br>ferritique/martensitique |
|  |                                                |

|  |                                      |
|--|--------------------------------------|
|  | Aciers inoxydables<br>[Cr-Ni/1.4301] |
|  |                                      |

|  |                                      |
|--|--------------------------------------|
|  | Aciers inoxydables<br>[Cr-Ni/1.4301] |
|  |                                      |

| MF  | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-----|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
| M12 | 12.0      | 0.75      | 10               | 265                       | 199             | 8                | 210                       | 158             | 6                | 160                       | 120             |
| M14 | 14.0      | 0.75      | 10               | 225                       | 169             | 8                | 180                       | 135             | 6                | 135                       | 101             |
| M16 | 16.0      | 0.75      | 10               | 200                       | 150             | 8                | 160                       | 120             | 6                | 120                       | 90              |
| M12 | 12.0      | 1.00      | 10               | 265                       | 265             | 8                | 210                       | 210             | 6                | 160                       | 160             |
| M13 | 13.0      | 1.00      | 10               | 245                       | 245             | 8                | 195                       | 195             | 6                | 145                       | 145             |
| M14 | 14.0      | 1.00      | 10               | 225                       | 225             | 8                | 180                       | 180             | 6                | 135                       | 135             |
| M16 | 16.0      | 1.00      | 10               | 200                       | 200             | 8                | 160                       | 160             | 6                | 120                       | 120             |
| M18 | 18.0      | 1.00      | 10               | 175                       | 175             | 8                | 140                       | 140             | 6                | 105                       | 105             |
| M20 | 20.0      | 1.00      | 10               | 160                       | 160             | 8                | 125                       | 125             | 6                | 95                        | 95              |
| M12 | 12.0      | 1.25      | 10               | 265                       | 331             | 8                | 210                       | 263             | 6                | 160                       | 200             |
| M14 | 14.0      | 1.25      | 10               | 225                       | 281             | 8                | 180                       | 225             | 6                | 135                       | 169             |
| M16 | 16.0      | 1.25      | 10               | 200                       | 250             | 8                | 160                       | 200             | 6                | 120                       | 150             |
| M12 | 12.0      | 1.50      | 10               | 265                       | 398             | 8                | 210                       | 315             | 6                | 160                       | 240             |
| M14 | 14.0      | 1.50      | 10               | 225                       | 338             | 8                | 180                       | 270             | 6                | 135                       | 203             |
| M16 | 16.0      | 1.50      | 10               | 200                       | 300             | 8                | 160                       | 240             | 6                | 120                       | 180             |
| M18 | 18.0      | 1.50      | 10               | 175                       | 263             | 8                | 140                       | 210             | 6                | 105                       | 158             |
| M20 | 20.0      | 1.50      | 10               | 160                       | 240             | 8                | 125                       | 188             | 6                | 95                        | 143             |
| M24 | 24.0      | 1.50      | 10               | 135                       | 203             | 8                | 105                       | 158             | 6                | 80                        | 120             |
| M12 | 12.0      | 0.75      | 5                | 135                       | 101             | 4                | 105                       | 79              | 3                | 80                        | 60              |
| M14 | 14.0      | 0.75      | 5                | 115                       | 86              | 4                | 90                        | 68              | 3                | 70                        | 53              |
| M16 | 16.0      | 0.75      | 5                | 100                       | 75              | 4                | 80                        | 60              | 3                | 60                        | 45              |
| M12 | 12.0      | 1.00      | 5                | 135                       | 135             | 4                | 105                       | 105             | 3                | 80                        | 80              |
| M13 | 13.0      | 1.00      | 5                | 120                       | 120             | 4                | 100                       | 100             | 3                | 75                        | 75              |
| M14 | 14.0      | 1.00      | 5                | 115                       | 115             | 4                | 90                        | 90              | 3                | 70                        | 70              |
| M16 | 16.0      | 1.00      | 5                | 100                       | 100             | 4                | 80                        | 80              | 3                | 60                        | 60              |
| M18 | 18.0      | 1.00      | 5                | 90                        | 90              | 4                | 70                        | 70              | 3                | 55                        | 55              |
| M20 | 20.0      | 1.00      | 5                | 80                        | 80              | 4                | 65                        | 65              | 3                | 50                        | 50              |
| M12 | 12.0      | 1.25      | 5                | 135                       | 169             | 4                | 105                       | 131             | 3                | 80                        | 100             |
| M14 | 14.0      | 1.25      | 5                | 115                       | 144             | 4                | 90                        | 113             | 3                | 70                        | 88              |
| M16 | 16.0      | 1.25      | 5                | 100                       | 125             | 4                | 80                        | 100             | 3                | 60                        | 75              |
| M12 | 12.0      | 1.50      | 5                | 135                       | 203             | 4                | 105                       | 158             | 3                | 80                        | 120             |
| M14 | 14.0      | 1.50      | 5                | 115                       | 173             | 4                | 90                        | 135             | 3                | 70                        | 105             |
| M16 | 16.0      | 1.50      | 5                | 100                       | 150             | 4                | 80                        | 120             | 3                | 60                        | 90              |
| M18 | 18.0      | 1.50      | 5                | 90                        | 135             | 4                | 70                        | 105             | 3                | 55                        | 83              |
| M20 | 20.0      | 1.50      | 5                | 80                        | 120             | 4                | 65                        | 98              | 3                | 50                        | 75              |
| M24 | 24.0      | 1.50      | 5                | 65                        | 98              | 4                | 55                        | 83              | 3                | 40                        | 60              |

| Application | Matières                                    |
|-------------|---------------------------------------------|
|             | Aciers inoxydables<br>[Cr-Ni-Mo-.../1.4571] |
|             |                                             |

|  |                                             |
|--|---------------------------------------------|
|  | Aciers inoxydables<br>[Cr-Ni-Mo-.../1.4571] |
|  |                                             |

|  |                                  |
|--|----------------------------------|
|  | Aciers réfractaires<br>[17-4 PH] |
|  |                                  |

|  |                                  |
|--|----------------------------------|
|  | Aciers réfractaires<br>[17-4 PH] |
|  |                                  |

| MF  | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-----|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
| M12 | 12.0      | 0.75      | 6                | 160                       | 120             | 5                | 135                       | 101             | 4                | 105                       | 79              |
| M14 | 14.0      | 0.75      | 6                | 135                       | 101             | 5                | 115                       | 86              | 4                | 90                        | 68              |
| M16 | 16.0      | 0.75      | 6                | 120                       | 90              | 5                | 100                       | 75              | 4                | 80                        | 60              |
| M12 | 12.0      | 1.00      | 6                | 160                       | 160             | 5                | 135                       | 135             | 4                | 105                       | 105             |
| M13 | 13.0      | 1.00      | 6                | 145                       | 145             | 5                | 120                       | 120             | 4                | 100                       | 100             |
| M14 | 14.0      | 1.00      | 6                | 135                       | 135             | 5                | 115                       | 115             | 4                | 90                        | 90              |
| M16 | 16.0      | 1.00      | 6                | 120                       | 120             | 5                | 100                       | 100             | 4                | 80                        | 80              |
| M18 | 18.0      | 1.00      | 6                | 105                       | 105             | 5                | 90                        | 90              | 4                | 70                        | 70              |
| M20 | 20.0      | 1.00      | 6                | 95                        | 95              | 5                | 80                        | 80              | 4                | 65                        | 65              |
| M12 | 12.0      | 1.25      | 6                | 160                       | 200             | 5                | 135                       | 169             | 4                | 105                       | 131             |
| M14 | 14.0      | 1.25      | 6                | 135                       | 169             | 5                | 115                       | 144             | 4                | 90                        | 113             |
| M16 | 16.0      | 1.25      | 6                | 120                       | 150             | 5                | 100                       | 125             | 4                | 80                        | 100             |
| M12 | 12.0      | 1.50      | 6                | 160                       | 240             | 5                | 135                       | 203             | 4                | 105                       | 158             |
| M14 | 14.0      | 1.50      | 6                | 135                       | 203             | 5                | 115                       | 173             | 4                | 90                        | 135             |
| M16 | 16.0      | 1.50      | 6                | 120                       | 180             | 5                | 100                       | 150             | 4                | 80                        | 120             |
| M18 | 18.0      | 1.50      | 6                | 105                       | 158             | 5                | 90                        | 135             | 4                | 70                        | 105             |
| M20 | 20.0      | 1.50      | 6                | 95                        | 143             | 5                | 80                        | 120             | 4                | 65                        | 98              |
| M24 | 24.0      | 1.50      | 6                | 80                        | 120             | 5                | 65                        | 98              | 4                | 55                        | 83              |
| M12 | 12.0      | 0.75      | 4                | 105                       | 79              | 3                | 80                        | 60              |                  |                           |                 |
| M14 | 14.0      | 0.75      | 4                | 90                        | 68              | 3                | 70                        | 53              |                  |                           |                 |
| M16 | 16.0      | 0.75      | 4                | 80                        | 60              | 3                | 60                        | 45              |                  |                           |                 |
| M12 | 12.0      | 1.00      | 4                | 105                       | 105             | 3                | 80                        | 80              |                  |                           |                 |
| M13 | 13.0      | 1.00      | 4                | 100                       | 100             | 3                | 75                        | 75              |                  |                           |                 |
| M14 | 14.0      | 1.00      | 4                | 90                        | 90              | 3                | 70                        | 70              |                  |                           |                 |
| M16 | 16.0      | 1.00      | 4                | 80                        | 80              | 3                | 60                        | 60              |                  |                           |                 |
| M18 | 18.0      | 1.00      | 4                | 70                        | 70              | 3                | 55                        | 55              |                  |                           |                 |
| M20 | 20.0      | 1.00      | 4                | 65                        | 65              | 3                | 50                        | 50              |                  |                           |                 |
| M12 | 12.0      | 1.25      | 4                | 105                       | 131             | 3                | 80                        | 100             |                  |                           |                 |
| M14 | 14.0      | 1.25      | 4                | 90                        | 113             | 3                | 70                        | 88              |                  |                           |                 |
| M16 | 16.0      | 1.25      | 4                | 80                        | 100             | 3                | 60                        | 75              |                  |                           |                 |
| M12 | 12.0      | 1.50      | 4                | 105                       | 158             | 3                | 80                        | 120             |                  |                           |                 |
| M14 | 14.0      | 1.50      | 4                | 90                        | 135             | 3                | 70                        | 105             |                  |                           |                 |
| M16 | 16.0      | 1.50      | 4                | 80                        | 120             | 3                | 60                        | 90              |                  |                           |                 |
| M18 | 18.0      | 1.50      | 4                | 70                        | 105             | 3                | 55                        | 83              |                  |                           |                 |
| M20 | 20.0      | 1.50      | 4                | 65                        | 98              | 3                | 50                        | 75              |                  |                           |                 |
| M24 | 24.0      | 1.50      | 4                | 55                        | 83              | 3                | 40                        | 60              |                  |                           |                 |

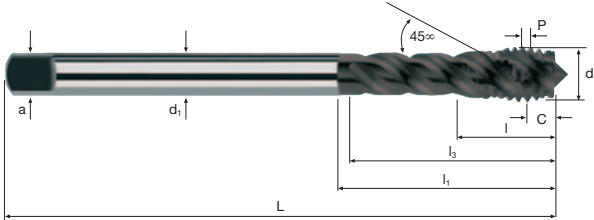


MF

ISO 2  
(6H)

HSS  
PM/F

X - P  
Form C



MF

Inox  
Stainless

| Exemple: N° cde                      |     |      |     |    |    |    |      |      |   |         | TRIBO  |
|--------------------------------------|-----|------|-----|----|----|----|------|------|---|---------|--------|
| N° d'article                         |     |      |     |    |    |    |      |      |   |         | ET1261 |
| Code-ø                               |     |      |     |    |    |    |      |      |   |         |        |
| Ø<br>Code                            | d   | P    | L   | l  | l1 | l3 | d1   | a    |   |         |        |
| .070                                 | M12 | 0.75 | 100 | 11 | 39 | 37 | 9.0  | 7.0  | 4 | 11.40 * | ●      |
| .072                                 | M14 | 0.75 | 100 | 11 | 39 | 37 | 11.0 | 9.0  | 4 | 13.40 * | ●      |
| .074                                 | M16 | 0.75 | 100 | 12 | 39 | 37 | 12.0 | 9.0  | 4 | 15.40 * | ●      |
| .094                                 | M12 | 1.00 | 100 | 11 | 39 | 37 | 9.0  | 7.0  | 4 | 11.10   | ●      |
| .095                                 | M13 | 1.00 | 100 | 11 | 39 | 37 | 11.0 | 9.0  | 4 | 12.10   | ●      |
| .096                                 | M14 | 1.00 | 100 | 11 | 39 | 37 | 11.0 | 9.0  | 4 | 13.10   | ●      |
| .097                                 | M15 | 1.00 | 100 | 12 | 39 | 37 | 12.0 | 9.0  | 4 | 14.10   | ●      |
| .098                                 | M16 | 1.00 | 100 | 12 | 39 | 37 | 12.0 | 9.0  | 4 | 15.10   | ●      |
| .099                                 | M17 | 1.00 | 100 | 12 | 39 | 37 | 12.0 | 9.0  | 4 | 16.10   | ●      |
| .100                                 | M18 | 1.00 | 110 | 13 | 50 | 48 | 14.0 | 11.0 | 4 | 17.10   | ●      |
| .102                                 | M20 | 1.00 | 125 | 14 | 65 | 63 | 16.0 | 12.0 | 4 | 19.10   | ●      |
| .164                                 | M12 | 1.25 | 100 | 15 | 39 | 37 | 9.0  | 7.0  | 4 | 10.90   | ●      |
| .166                                 | M14 | 1.25 | 100 | 15 | 39 | 37 | 11.0 | 9.0  | 4 | 12.90   | ●      |
| .168                                 | M16 | 1.25 | 100 | 15 | 39 | 37 | 12.0 | 9.0  | 4 | 14.90   | ●      |
| .176                                 | M12 | 1.50 | 100 | 15 | 39 | 37 | 9.0  | 7.0  | 4 | 10.70 * | ●      |
| .178                                 | M14 | 1.50 | 100 | 15 | 39 | 37 | 11.0 | 9.0  | 4 | 12.70 * | ●      |
| .180                                 | M16 | 1.50 | 100 | 15 | 39 | 37 | 12.0 | 9.0  | 4 | 14.70 * | ●      |
| .182                                 | M18 | 1.50 | 110 | 17 | 50 | 48 | 14.0 | 11.0 | 4 | 16.70 * | ●      |
| .184                                 | M20 | 1.50 | 125 | 18 | 65 | 63 | 16.0 | 12.0 | 4 | 18.70 * | ●      |
| .186                                 | M22 | 1.50 | 125 | 18 | 65 | 63 | 18.0 | 14.5 | 5 | 20.70 * | ●      |
| .188                                 | M24 | 1.50 | 140 | 20 | 72 | 70 | 18.0 | 14.5 | 5 | 22.70 * | ●      |
| * La dimension donnée est hors norme |     |      |     |    |    |    |      |      |   |         |        |

| Application | Matières | MF    | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] |
|-------------|----------|-------|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
|             | Fonte GG | M 2.5 | 2.5       | 0.35      | 28               | 3565                      | 1248            | 24               | 3055                      | 1069            | 20               | 2545                      | 891             |
|             |          | M 3   | 3.0       | 0.35      | 28               | 2970                      | 1040            | 24               | 2545                      | 891             | 20               | 2120                      | 742             |
|             |          | M 3.5 | 3.5       | 0.35      | 28               | 2545                      | 891             | 24               | 2185                      | 765             | 20               | 1820                      | 637             |
|             |          | M 4   | 4.0       | 0.50      | 28               | 2230                      | 1115            | 24               | 1910                      | 955             | 20               | 1590                      | 795             |
|             |          | M 5   | 5.0       | 0.50      | 28               | 1785                      | 893             | 24               | 1530                      | 765             | 20               | 1275                      | 638             |
|             |          | M 6   | 6.0       | 0.50      | 28               | 1485                      | 743             | 24               | 1275                      | 638             | 20               | 1060                      | 530             |
|             |          | M 8   | 8.0       | 0.50      | 28               | 1115                      | 558             | 24               | 955                       | 478             | 20               | 795                       | 398             |
|             |          | M10   | 10.0      | 0.50      | 28               | 890                       | 445             | 24               | 765                       | 383             | 20               | 635                       | 318             |
|             |          | M 6   | 6.0       | 0.75      | 28               | 1485                      | 1114            | 24               | 1275                      | 956             | 20               | 1060                      | 795             |
|             |          | M 7   | 7.0       | 0.75      | 28               | 1275                      | 956             | 24               | 1090                      | 818             | 20               | 910                       | 683             |
|             |          | M 8   | 8.0       | 0.75      | 28               | 1115                      | 836             | 24               | 955                       | 716             | 20               | 795                       | 596             |
|             |          | M10   | 10.0      | 0.75      | 28               | 890                       | 668             | 24               | 765                       | 574             | 20               | 635                       | 476             |
| Fonte GG    |          | M 8   | 8.0       | 1.00      | 28               | 1115                      | 1115            | 24               | 955                       | 955             | 20               | 795                       | 795             |
|             |          | M 9   | 9.0       | 1.00      | 28               | 990                       | 990             | 24               | 850                       | 850             | 20               | 705                       | 705             |
|             |          | M10   | 10.0      | 1.00      | 28               | 890                       | 890             | 24               | 765                       | 765             | 20               | 635                       | 635             |
|             |          | M10   | 10.0      | 1.25      | 28               | 890                       | 1113            | 24               | 765                       | 956             | 20               | 635                       | 794             |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
| Fonte GGG   |          | M 2.5 | 2.5       | 0.35      | 20               | 2545                      | 891             | 18               | 2290                      | 802             | 15               | 1910                      | 669             |
|             |          | M 3   | 3.0       | 0.35      | 20               | 2120                      | 742             | 18               | 1910                      | 669             | 15               | 1590                      | 557             |
|             |          | M 3.5 | 3.5       | 0.35      | 20               | 1820                      | 637             | 18               | 1635                      | 572             | 15               | 1365                      | 478             |
|             |          | M 4   | 4.0       | 0.50      | 20               | 1590                      | 795             | 18               | 1430                      | 715             | 15               | 1195                      | 598             |
|             |          | M 5   | 5.0       | 0.50      | 20               | 1275                      | 638             | 18               | 1145                      | 573             | 15               | 955                       | 478             |
|             |          | M 6   | 6.0       | 0.50      | 20               | 1060                      | 530             | 18               | 955                       | 478             | 15               | 795                       | 398             |
|             |          | M 8   | 8.0       | 0.50      | 20               | 795                       | 398             | 18               | 715                       | 358             | 15               | 595                       | 298             |
|             |          | M10   | 10.0      | 0.50      | 20               | 635                       | 318             | 18               | 575                       | 288             | 15               | 475                       | 238             |
|             |          | M 6   | 6.0       | 0.75      | 20               | 1060                      | 795             | 18               | 955                       | 716             | 15               | 795                       | 596             |
|             |          | M 7   | 7.0       | 0.75      | 20               | 910                       | 683             | 18               | 820                       | 615             | 15               | 680                       | 510             |
| Fonte GGG   |          | M 8   | 8.0       | 0.75      | 20               | 795                       | 596             | 18               | 715                       | 536             | 15               | 595                       | 446             |
|             |          | M10   | 10.0      | 0.75      | 20               | 635                       | 476             | 18               | 575                       | 431             | 15               | 475                       | 356             |
|             |          | M 8   | 8.0       | 1.00      | 20               | 795                       | 795             | 18               | 715                       | 715             | 15               | 595                       | 595             |
|             |          | M 9   | 9.0       | 1.00      | 20               | 705                       | 705             | 18               | 635                       | 635             | 15               | 530                       | 530             |
|             |          | M10   | 10.0      | 1.00      | 20               | 635                       | 635             | 18               | 575                       | 575             | 15               | 475                       | 475             |
|             |          | M10   | 10.0      | 1.25      | 20               | 635                       | 794             | 18               | 575                       | 719             | 15               | 475                       | 594             |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |

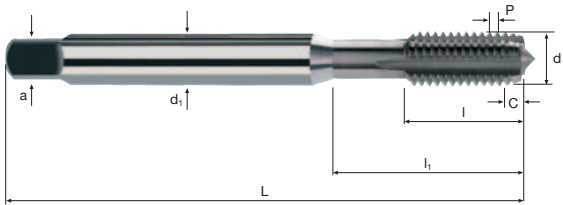
| Application | Matières | MF    | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] |
|-------------|----------|-------|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
|             | Fonte GG | M 2.5 | 2.5       | 0.35      | 30               | 3820                      | 1337            | 28               | 3565                      | 1248            | 25               | 3185                      | 1115            |
|             |          | M 3   | 3.0       | 0.35      | 30               | 3185                      | 1115            | 28               | 2970                      | 1040            | 25               | 2655                      | 929             |
|             |          | M 3.5 | 3.5       | 0.35      | 30               | 2730                      | 955             | 28               | 2545                      | 891             | 25               | 2275                      | 796             |
|             |          | M 4   | 4.0       | 0.50      | 30               | 2385                      | 1193            | 28               | 2230                      | 1115            | 25               | 1990                      | 995             |
|             |          | M 5   | 5.0       | 0.50      | 30               | 1910                      | 955             | 28               | 1785                      | 893             | 25               | 1590                      | 795             |
|             |          | M 6   | 6.0       | 0.50      | 30               | 1590                      | 795             | 28               | 1485                      | 743             | 25               | 1325                      | 663             |
|             |          | M 8   | 8.0       | 0.50      | 30               | 1195                      | 598             | 28               | 1115                      | 558             | 25               | 995                       | 498             |
|             |          | M10   | 10.0      | 0.50      | 30               | 955                       | 478             | 28               | 890                       | 445             | 25               | 795                       | 398             |
|             |          | M 6   | 6.0       | 0.75      | 30               | 1590                      | 1193            | 28               | 1485                      | 1114            | 25               | 1325                      | 994             |
|             |          | M 7   | 7.0       | 0.75      | 30               | 1365                      | 1024            | 28               | 1275                      | 956             | 25               | 1135                      | 851             |
|             |          | M 8   | 8.0       | 0.75      | 30               | 1195                      | 896             | 28               | 1115                      | 836             | 25               | 995                       | 746             |
|             |          | M10   | 10.0      | 0.75      | 30               | 955                       | 716             | 28               | 890                       | 668             | 25               | 795                       | 596             |
| Fonte GG    |          | M 8   | 8.0       | 1.00      | 30               | 1195                      | 1195            | 28               | 1115                      | 1115            | 25               | 995                       | 995             |
|             |          | M 9   | 9.0       | 1.00      | 30               | 1060                      | 1060            | 28               | 990                       | 990             | 25               | 885                       | 885             |
|             |          | M10   | 10.0      | 1.00      | 30               | 955                       | 955             | 28               | 890                       | 890             | 25               | 795                       | 795             |
|             |          | M10   | 10.0      | 1.25      | 30               | 955                       | 1194            | 28               | 890                       | 1113            | 25               | 795                       | 994             |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
| Fonte GGG   |          | M 2.5 | 2.5       | 0.35      | 25               | 3185                      | 1115            | 22               | 2800                      | 980             | 20               | 2545                      | 891             |
|             |          | M 3   | 3.0       | 0.35      | 25               | 2655                      | 929             | 22               | 2335                      | 817             | 20               | 2120                      | 742             |
|             |          | M 3.5 | 3.5       | 0.35      | 25               | 2275                      | 796             | 22               | 2000                      | 700             | 20               | 1820                      | 637             |
|             |          | M 4   | 4.0       | 0.50      | 25               | 1990                      | 995             | 22               | 1750                      | 875             | 20               | 1590                      | 795             |
|             |          | M 5   | 5.0       | 0.50      | 25               | 1590                      | 795             | 22               | 1400                      | 700             | 20               | 1275                      | 638             |
|             |          | M 6   | 6.0       | 0.50      | 25               | 1325                      | 663             | 22               | 1165                      | 583             | 20               | 1060                      | 530             |
|             |          | M 8   | 8.0       | 0.50      | 25               | 995                       | 498             | 22               | 875                       | 438             | 20               | 795                       | 398             |
|             |          | M10   | 10.0      | 0.50      | 25               | 795                       | 398             | 22               | 700                       | 350             | 20               | 635                       | 318             |
|             |          | M 6   | 6.0       | 0.75      | 25               | 1325                      | 994             | 22               | 1165                      | 874             | 20               | 1060                      | 795             |
|             |          | M 7   | 7.0       | 0.75      | 25               | 1135                      | 851             | 22               | 1000                      | 750             | 20               | 910                       | 683             |
| Fonte GGG   |          | M 8   | 8.0       | 0.75      | 25               | 995                       | 746             | 22               | 875                       | 656             | 20               | 795                       | 596             |
|             |          | M10   | 10.0      | 0.75      | 25               | 795                       | 596             | 22               | 700                       | 525             | 20               | 635                       | 476             |
|             |          | M 8   | 8.0       | 1.00      | 25               | 995                       | 995             | 22               | 875                       | 875             | 20               | 795                       | 795             |
|             |          | M 9   | 9.0       | 1.00      | 25               | 885                       | 885             | 22               | 780                       | 780             | 20               | 705                       | 705             |
|             |          | M10   | 10.0      | 1.00      | 25               | 795                       | 795             | 22               | 700                       | 700             | 20               | 635                       | 635             |
|             |          | M10   | 10.0      | 1.25      | 25               | 795                       | 994             | 22               | 700                       | 875             | 20               | 635                       | 794             |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|             |          |       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |



MF

ISO 2  
(6H)

HSS  
PM/F



MF

GG(G)

| Exemple: N° cde                                            |       |      |     |    |    |      |     |   |      | TiCN   |   |
|------------------------------------------------------------|-------|------|-----|----|----|------|-----|---|------|--------|---|
| N° d'article Code-ø                                        |       |      |     |    |    |      |     |   |      | EH1270 |   |
| Ø Code                                                     | d     | P    | L   | l  | l1 | d1   | a   |   |      |        |   |
| .029                                                       | M 2.5 | 0.35 | 50  | 9  | —  | 2.8  | 2.1 | 3 | 2.15 |        | ● |
| .031                                                       | M 3   | 0.35 | 56  | 12 | 18 | 3.5  | 2.7 | 3 | 2.65 |        | ● |
| .032                                                       | M 3.5 | 0.35 | 56  | 12 | 20 | 4.0  | 3.0 | 3 | 3.15 |        | ● |
| .046                                                       | M 4   | 0.50 | 63  | 13 | 21 | 4.5  | 3.4 | 3 | 3.50 |        | ● |
| .048                                                       | M 5   | 0.50 | 70  | 15 | 25 | 6.0  | 4.9 | 3 | 4.50 |        | ● |
| .050                                                       | M 6   | 0.50 | 80  | 17 | 30 | 6.0  | 4.9 | 4 | 5.50 |        | ● |
| .052                                                       | M 8   | 0.50 | 90  | 20 | 35 | 8.0  | 6.2 | 4 | 7.50 |        | ● |
| .054                                                       | M10   | 0.50 | 100 | 22 | 39 | 10.0 | 8.0 | 4 | 9.50 |        | ● |
| .064                                                       | M 6   | 0.75 | 80  | 17 | 30 | 6.0  | 4.9 | 4 | 5.20 |        | ● |
| .065                                                       | M 7   | 0.75 | 80  | 17 | 30 | 7.0  | 5.5 | 4 | 6.20 |        | ● |
| .066                                                       | M 8   | 0.75 | 90  | 20 | 35 | 8.0  | 6.2 | 4 | 7.20 |        | ● |
| .068                                                       | M10   | 0.75 | 100 | 22 | 39 | 10.0 | 8.0 | 4 | 9.20 |        | ● |
| .090                                                       | M 8   | 1.00 | 90  | 20 | 35 | 8.0  | 6.2 | 4 | 7.00 |        | ● |
| .091                                                       | M 9   | 1.00 | 90  | 20 | 35 | 9.0  | 7.0 | 4 | 8.00 |        | ● |
| .092                                                       | M10   | 1.00 | 100 | 22 | 39 | 10.0 | 8.0 | 4 | 9.00 |        | ● |
| .162                                                       | M10   | 1.25 | 100 | 22 | 39 | 10.0 | 8.0 | 4 | 8.80 |        | ● |
| Dimensions plus grandes voir N° d'article EH1271, page 267 |       |      |     |    |    |      |     |   |      |        |   |

| Application | Matières     | MF  | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] |
|-------------|--------------|-----|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
|             | Fonte<br>GG  | M12 | 12.0      | 0.75      | 28               | 745                       | 559             | 24               | 635                       | 476             | 20               | 530                       | 398             |
|             |              | M14 | 14.0      | 0.75      | 28               | 635                       | 476             | 24               | 545                       | 409             | 20               | 455                       | 341             |
|             |              | M16 | 16.0      | 0.75      | 28               | 555                       | 416             | 24               | 475                       | 356             | 20               | 400                       | 300             |
|             |              | M12 | 12.0      | 1.00      | 28               | 745                       | 745             | 24               | 635                       | 635             | 20               | 530                       | 530             |
|             |              | M13 | 13.0      | 1.00      | 28               | 685                       | 685             | 24               | 590                       | 590             | 20               | 490                       | 490             |
|             |              | M14 | 14.0      | 1.00      | 28               | 635                       | 635             | 24               | 545                       | 545             | 20               | 455                       | 455             |
|             |              | M16 | 16.0      | 1.00      | 28               | 555                       | 555             | 24               | 475                       | 475             | 20               | 400                       | 400             |
|             |              | M18 | 18.0      | 1.00      | 28               | 495                       | 495             | 24               | 425                       | 425             | 20               | 355                       | 355             |
|             |              | M20 | 20.0      | 1.00      | 28               | 445                       | 445             | 24               | 380                       | 380             | 20               | 320                       | 320             |
|             | Fonte<br>GG  | M12 | 12.0      | 1.25      | 28               | 745                       | 931             | 24               | 635                       | 794             | 20               | 530                       | 663             |
|             |              | M14 | 14.0      | 1.25      | 28               | 635                       | 794             | 24               | 545                       | 681             | 20               | 455                       | 569             |
|             |              | M16 | 16.0      | 1.25      | 28               | 555                       | 694             | 24               | 475                       | 594             | 20               | 400                       | 500             |
|             |              | M12 | 12.0      | 1.50      | 28               | 745                       | 1118            | 24               | 635                       | 953             | 20               | 530                       | 795             |
|             |              | M14 | 14.0      | 1.50      | 28               | 635                       | 953             | 24               | 545                       | 818             | 20               | 455                       | 683             |
|             |              | M16 | 16.0      | 1.50      | 28               | 555                       | 833             | 24               | 475                       | 713             | 20               | 400                       | 600             |
|             |              | M18 | 18.0      | 1.50      | 28               | 495                       | 743             | 24               | 425                       | 638             | 20               | 355                       | 533             |
|             |              | M20 | 20.0      | 1.50      | 28               | 445                       | 668             | 24               | 380                       | 570             | 20               | 320                       | 480             |
|             | Fonte<br>GGG | M12 | 12.0      | 0.75      | 20               | 530                       | 398             | 18               | 475                       | 356             | 15               | 400                       | 300             |
|             |              | M14 | 14.0      | 0.75      | 20               | 455                       | 341             | 18               | 410                       | 308             | 15               | 340                       | 255             |
|             |              | M16 | 16.0      | 0.75      | 20               | 400                       | 300             | 18               | 360                       | 270             | 15               | 300                       | 225             |
|             |              | M12 | 12.0      | 1.00      | 20               | 530                       | 530             | 18               | 475                       | 475             | 15               | 400                       | 400             |
|             |              | M13 | 13.0      | 1.00      | 20               | 490                       | 490             | 18               | 440                       | 440             | 15               | 365                       | 365             |
|             |              | M14 | 14.0      | 1.00      | 20               | 455                       | 455             | 18               | 410                       | 410             | 15               | 340                       | 340             |
|             |              | M16 | 16.0      | 1.00      | 20               | 400                       | 400             | 18               | 360                       | 360             | 15               | 300                       | 300             |
|             |              | M18 | 18.0      | 1.00      | 20               | 355                       | 355             | 18               | 320                       | 320             | 15               | 265                       | 265             |
|             | Fonte<br>GGG | M20 | 20.0      | 1.00      | 20               | 320                       | 320             | 18               | 285                       | 285             | 15               | 240                       | 240             |
|             |              | M12 | 12.0      | 1.25      | 20               | 530                       | 663             | 18               | 475                       | 594             | 15               | 400                       | 500             |
|             |              | M14 | 14.0      | 1.25      | 20               | 455                       | 569             | 18               | 410                       | 513             | 15               | 340                       | 425             |
|             |              | M16 | 16.0      | 1.25      | 20               | 400                       | 500             | 18               | 360                       | 450             | 15               | 300                       | 375             |
|             |              | M12 | 12.0      | 1.50      | 20               | 530                       | 795             | 18               | 475                       | 713             | 15               | 400                       | 600             |
|             |              | M14 | 14.0      | 1.50      | 20               | 455                       | 683             | 18               | 410                       | 615             | 15               | 340                       | 510             |
|             |              | M16 | 16.0      | 1.50      | 20               | 400                       | 600             | 18               | 360                       | 540             | 15               | 300                       | 450             |
|             |              | M18 | 18.0      | 1.50      | 20               | 355                       | 533             | 18               | 320                       | 480             | 15               | 265                       | 398             |
|             |              | M20 | 20.0      | 1.50      | 20               | 320                       | 480             | 18               | 285                       | 428             | 15               | 240                       | 360             |
|             |              | M24 | 24.0      | 1.50      | 20               | 265                       | 398             | 18               | 240                       | 360             | 15               | 200                       | 300             |

| Application | Matières     | MF  | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] | $V_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] | $V_f$<br>[100%] |
|-------------|--------------|-----|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
|             | Fonte<br>GG  | M12 | 12.0      | 0.75      | 30               | 795                       | 596             | 28               | 745                       | 559             | 25               | 665                       | 499             |
|             |              | M14 | 14.0      | 0.75      | 30               | 680                       | 510             | 28               | 635                       | 476             | 25               | 570                       | 428             |
|             |              | M16 | 16.0      | 0.75      | 30               | 595                       | 446             | 28               | 555                       | 416             | 25               | 495                       | 371             |
|             |              | M12 | 12.0      | 1.00      | 30               | 795                       | 795             | 28               | 745                       | 745             | 25               | 665                       | 665             |
|             |              | M13 | 13.0      | 1.00      | 30               | 735                       | 735             | 28               | 685                       | 685             | 25               | 610                       | 610             |
|             |              | M14 | 14.0      | 1.00      | 30               | 680                       | 680             | 28               | 635                       | 635             | 25               | 570                       | 570             |
|             |              | M16 | 16.0      | 1.00      | 30               | 595                       | 595             | 28               | 555                       | 555             | 25               | 495                       | 495             |
|             |              | M18 | 18.0      | 1.00      | 30               | 530                       | 530             | 28               | 495                       | 495             | 25               | 440                       | 440             |
|             |              | M20 | 20.0      | 1.00      | 30               | 475                       | 475             | 28               | 445                       | 445             | 25               | 400                       | 400             |
|             | Fonte<br>GG  | M12 | 12.0      | 1.25      | 30               | 795                       | 994             | 28               | 745                       | 931             | 25               | 665                       | 831             |
|             |              | M14 | 14.0      | 1.25      | 30               | 680                       | 850             | 28               | 635                       | 794             | 25               | 570                       | 713             |
|             |              | M16 | 16.0      | 1.25      | 30               | 595                       | 744             | 28               | 555                       | 694             | 25               | 495                       | 619             |
|             |              | M12 | 12.0      | 1.50      | 30               | 795                       | 1193            | 28               | 745                       | 1118            | 25               | 665                       | 998             |
|             |              | M14 | 14.0      | 1.50      | 30               | 680                       | 1020            | 28               | 635                       | 953             | 25               | 570                       | 855             |
|             |              | M16 | 16.0      | 1.50      | 30               | 595                       | 893             | 28               | 555                       | 833             | 25               | 495                       | 743             |
|             |              | M18 | 18.0      | 1.50      | 30               | 530                       | 795             | 28               | 495                       | 743             | 25               | 440                       | 660             |
|             |              | M20 | 20.0      | 1.50      | 30               | 475                       | 713             | 28               | 445                       | 668             | 25               | 400                       | 600             |
|             | Fonte<br>GGG | M24 | 24.0      | 1.50      | 30               | 400                       | 600             | 28               | 370                       | 555             | 25               | 330                       | 495             |
|             |              | M12 | 12.0      | 0.75      | 25               | 665                       | 499             | 22               | 585                       | 439             | 20               | 530                       | 398             |
|             |              | M14 | 14.0      | 0.75      | 25               | 570                       | 428             | 22               | 500                       | 375             | 20               | 455                       | 341             |
|             |              | M16 | 16.0      | 0.75      | 25               | 495                       | 371             | 22               | 440                       | 330             | 20               | 400                       | 300             |
|             |              | M12 | 12.0      | 1.00      | 25               | 665                       | 665             | 22               | 585                       | 585             | 20               | 530                       | 530             |
|             |              | M13 | 13.0      | 1.00      | 25               | 610                       | 610             | 22               | 540                       | 540             | 20               | 490                       | 490             |
|             |              | M14 | 14.0      | 1.00      | 25               | 570                       | 570             | 22               | 500                       | 500             | 20               | 455                       | 455             |
|             |              | M16 | 16.0      | 1.00      | 25               | 495                       | 495             | 22               | 440                       | 440             | 20               | 400                       | 400             |
|             | Fonte<br>GGG | M18 | 18.0      | 1.00      | 25               | 440                       | 440             | 22               | 390                       | 390             | 20               | 355                       | 355             |
|             |              | M20 | 20.0      | 1.00      | 25               | 400                       | 400             | 22               | 350                       | 350             | 20               | 320                       | 320             |
|             |              | M12 | 12.0      | 1.25      | 25               | 665                       | 831             | 22               | 585                       | 731             | 20               | 530                       | 663             |
|             |              | M14 | 14.0      | 1.25      | 25               | 570                       | 713             | 22               | 500                       | 625             | 20               | 455                       | 569             |
|             |              | M16 | 16.0      | 1.25      | 25               | 495                       | 619             | 22               | 440                       | 550             | 20               | 400                       | 500             |
|             |              | M12 | 12.0      | 1.50      | 25               | 665                       | 998             | 22               | 585                       | 878             | 20               | 530                       | 795             |
|             |              | M14 | 14.0      | 1.50      | 25               | 570                       | 855             | 22               | 500                       | 750             | 20               | 455                       | 683             |
|             |              | M16 | 16.0      | 1.50      | 25               | 495                       | 743             | 22               | 440                       | 660             | 20               | 400                       | 600             |
|             |              | M18 | 18.0      | 1.50      | 25               | 440                       | 660             | 22               | 390                       | 585             | 20               | 355                       | 533             |
|             |              | M20 | 20.0      | 1.50      | 25               | 400                       | 600             | 22               | 350                       | 525             | 20               | 320                       | 480             |
|             |              | M24 | 24.0      | 1.50      | 25               | 330                       | 495             | 22               | 290                       | 435             | 20               | 265                       | 398             |

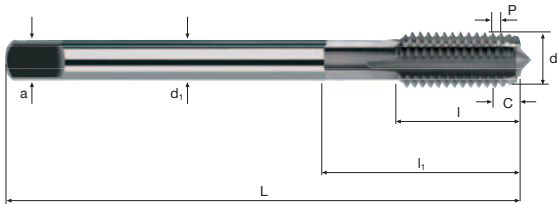


MF

ISO 2  
(6H)

HSS  
PM/F

X - P  
Form C

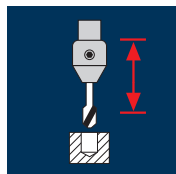


MF

GG(G)

|           |     |      |     |    |                |                |      |   |       | TiCN   |   |
|-----------|-----|------|-----|----|----------------|----------------|------|---|-------|--------|---|
|           |     |      |     |    |                |                |      |   |       | EH1271 |   |
|           |     |      |     |    |                |                |      |   |       |        |   |
| Ø<br>Code | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a    |   |       |        |   |
| .070      | M12 | 0.75 | 100 | 18 | 39             | 9.0            | 7.0  | 4 | 11.30 |        | ● |
| .072      | M14 | 0.75 | 100 | 18 | 39             | 11.0           | 9.0  | 4 | 13.30 |        | ● |
| .074      | M16 | 0.75 | 100 | 18 | 39             | 12.0           | 9.0  | 4 | 15.30 |        | ● |
| .094      | M12 | 1.00 | 100 | 18 | 39             | 9.0            | 7.0  | 4 | 11.00 |        | ● |
| .095      | M13 | 1.00 | 100 | 18 | 39             | 11.0           | 9.0  | 4 | 12.00 |        | ● |
| .096      | M14 | 1.00 | 100 | 18 | 39             | 11.0           | 9.0  | 4 | 13.00 |        | ● |
| .097      | M15 | 1.00 | 100 | 18 | 39             | 12.0           | 9.0  | 4 | 14.00 |        | ● |
| .098      | M16 | 1.00 | 100 | 18 | 39             | 12.0           | 9.0  | 4 | 15.00 |        | ● |
| .099      | M17 | 1.00 | 100 | 18 | 39             | 12.0           | 9.0  | 4 | 16.00 |        | ● |
| .100      | M18 | 1.00 | 110 | 20 | 45             | 14.0           | 11.0 | 4 | 17.00 |        | ● |
| .102      | M20 | 1.00 | 125 | 20 | 50             | 16.0           | 12.0 | 4 | 19.00 |        | ● |
| .164      | M12 | 1.25 | 100 | 22 | 39             | 9.0            | 7.0  | 4 | 10.80 |        | ● |
| .166      | M14 | 1.25 | 100 | 22 | 39             | 11.0           | 9.0  | 4 | 12.80 |        | ● |
| .168      | M16 | 1.25 | 100 | 22 | 39             | 12.0           | 9.0  | 4 | 14.80 |        | ● |
| .176      | M12 | 1.50 | 100 | 22 | 39             | 9.0            | 7.0  | 4 | 10.50 |        | ● |
| .178      | M14 | 1.50 | 100 | 22 | 39             | 11.0           | 9.0  | 4 | 12.50 |        | ● |
| .180      | M16 | 1.50 | 100 | 22 | 39             | 12.0           | 9.0  | 4 | 14.50 |        | ● |
| .182      | M18 | 1.50 | 110 | 25 | 45             | 14.0           | 11.0 | 4 | 16.50 |        | ● |
| .184      | M20 | 1.50 | 125 | 26 | 50             | 16.0           | 12.0 | 4 | 18.50 |        | ● |
| .186      | M22 | 1.50 | 125 | 26 | 50             | 18.0           | 14.5 | 5 | 20.50 |        | ● |
| .188      | M24 | 1.50 | 140 | 27 | 52             | 18.0           | 14.5 | 5 | 22.50 |        | ● |
|           |     |      |     |    |                |                |      |   |       |        |   |
|           |     |      |     |    |                |                |      |   |       |        |   |

## Application



## Matières

Aciers  
500 - 850 N/mm<sup>2</sup>

| MF  | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] |
|-----|-----------|-----------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
| M 3 | 3.0       | 0.35      | 22               | 2335                      | 20               | 2120                      | 12               | 1275                      |
| M 4 | 4.0       | 0.50      | 22               | 1750                      | 20               | 1590                      | 12               | 955                       |
| M 5 | 5.0       | 0.50      | 22               | 1400                      | 20               | 1275                      | 12               | 765                       |
| M 6 | 6.0       | 0.50      | 22               | 1165                      | 20               | 1060                      | 12               | 635                       |
| M 6 | 6.0       | 0.75      | 22               | 1165                      | 20               | 1060                      | 12               | 635                       |
| M 8 | 8.0       | 0.75      | 22               | 875                       | 20               | 795                       | 12               | 475                       |
| M10 | 10.0      | 0.75      | 22               | 700                       | 20               | 635                       | 12               | 380                       |
| M 8 | 8.0       | 1.00      | 22               | 875                       | 20               | 795                       | 12               | 475                       |
| M10 | 10.0      | 1.00      | 22               | 700                       | 20               | 635                       | 12               | 380                       |

Aciers  
500 - 850 N/mm<sup>2</sup>

|     |      |      |    |     |    |     |    |     |
|-----|------|------|----|-----|----|-----|----|-----|
| M12 | 12.0 | 1.00 | 22 | 585 | 20 | 530 | 12 | 320 |
| M14 | 14.0 | 1.00 | 22 | 500 | 20 | 455 | 12 | 275 |
| M16 | 16.0 | 1.00 | 22 | 440 | 20 | 400 | 12 | 240 |
| M10 | 10.0 | 1.25 | 22 | 700 | 20 | 635 | 12 | 380 |
| M12 | 12.0 | 1.25 | 22 | 585 | 20 | 530 | 12 | 320 |
| M12 | 12.0 | 1.50 | 22 | 585 | 20 | 530 | 12 | 320 |
| M14 | 14.0 | 1.50 | 22 | 500 | 20 | 455 | 12 | 275 |
| M16 | 16.0 | 1.50 | 22 | 440 | 20 | 400 | 12 | 240 |
| M20 | 20.0 | 1.50 | 22 | 350 | 20 | 320 | 12 | 190 |

Aciers  
850 - 1100 N/mm<sup>2</sup>

|     |      |      |    |      |    |      |   |     |
|-----|------|------|----|------|----|------|---|-----|
| M 3 | 3.0  | 0.35 | 18 | 1910 | 12 | 1275 | 8 | 850 |
| M 4 | 4.0  | 0.50 | 18 | 1430 | 12 | 955  | 8 | 635 |
| M 5 | 5.0  | 0.50 | 18 | 1145 | 12 | 765  | 8 | 510 |
| M 6 | 6.0  | 0.50 | 18 | 955  | 12 | 635  | 8 | 425 |
| M 6 | 6.0  | 0.75 | 18 | 955  | 12 | 635  | 8 | 425 |
| M 8 | 8.0  | 0.75 | 18 | 715  | 12 | 475  | 8 | 320 |
| M10 | 10.0 | 0.75 | 18 | 575  | 12 | 380  | 8 | 255 |
| M 8 | 8.0  | 1.00 | 18 | 715  | 12 | 475  | 8 | 320 |
| M10 | 10.0 | 1.00 | 18 | 575  | 12 | 380  | 8 | 255 |

Aciers  
850 - 1100 N/mm<sup>2</sup>

|     |      |      |    |     |    |     |   |     |
|-----|------|------|----|-----|----|-----|---|-----|
| M12 | 12.0 | 1.00 | 18 | 475 | 12 | 320 | 8 | 210 |
| M14 | 14.0 | 1.00 | 18 | 410 | 12 | 275 | 8 | 180 |
| M16 | 16.0 | 1.00 | 18 | 360 | 12 | 240 | 8 | 160 |
| M10 | 10.0 | 1.25 | 18 | 575 | 12 | 380 | 8 | 255 |
| M12 | 12.0 | 1.25 | 18 | 475 | 12 | 320 | 8 | 210 |
| M12 | 12.0 | 1.50 | 18 | 475 | 12 | 320 | 8 | 210 |
| M14 | 14.0 | 1.50 | 18 | 410 | 12 | 275 | 8 | 180 |
| M16 | 16.0 | 1.50 | 18 | 360 | 12 | 240 | 8 | 160 |
| M20 | 20.0 | 1.50 | 18 | 285 | 12 | 190 | 8 | 125 |

## Matières

Aciers inoxydables  
[Cr-Ni/1.4301]



| MF  | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.0 x d | n<br>[min <sup>-1</sup> ] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] |
|-----|-----------|-----------|------------------|---------------------------|------------------|---------------------------|------------------|---------------------------|
| M 3 | 3.0       | 0.35      | 4                | 425                       | 3                | 320                       | 2                | 210                       |
| M 4 | 4.0       | 0.50      | 4                | 320                       | 3                | 240                       | 2                | 160                       |
| M 5 | 5.0       | 0.50      | 4                | 255                       | 3                | 190                       | 2                | 125                       |
| M 6 | 6.0       | 0.50      | 4                | 210                       | 3                | 160                       | 2                | 105                       |
| M 6 | 6.0       | 0.75      | 4                | 210                       | 3                | 160                       | 2                | 105                       |
| M 8 | 8.0       | 0.75      | 4                | 160                       | 3                | 120                       | 2                | 80                        |
| M10 | 10.0      | 0.75      | 4                | 125                       | 3                | 95                        | 2                | 65                        |
| M 8 | 8.0       | 1.00      | 4                | 160                       | 3                | 120                       | 2                | 80                        |
| M10 | 10.0      | 1.00      | 4                | 125                       | 3                | 95                        | 2                | 65                        |

Aciers inoxydables  
[Cr-Ni/1.4301]



|     |      |      |   |     |   |    |   |    |
|-----|------|------|---|-----|---|----|---|----|
| M12 | 12.0 | 1.00 | 4 | 105 | 3 | 80 | 2 | 55 |
| M14 | 14.0 | 1.00 | 4 | 90  | 3 | 70 | 2 | 45 |
| M16 | 16.0 | 1.00 | 4 | 80  | 3 | 60 | 2 | 40 |
| M10 | 10.0 | 1.25 | 4 | 125 | 3 | 95 | 2 | 65 |
| M12 | 12.0 | 1.25 | 4 | 105 | 3 | 80 | 2 | 55 |
| M12 | 12.0 | 1.50 | 4 | 105 | 3 | 80 | 2 | 55 |
| M14 | 14.0 | 1.50 | 4 | 90  | 3 | 70 | 2 | 45 |
| M16 | 16.0 | 1.50 | 4 | 80  | 3 | 60 | 2 | 40 |
| M20 | 20.0 | 1.50 | 4 | 65  | 3 | 50 | 2 | 30 |

Aluminium corroyé  
Si < 6%  
trempé

|     |      |      |    |      |    |      |   |     |
|-----|------|------|----|------|----|------|---|-----|
| M 3 | 3.0  | 0.35 | 12 | 1275 | 10 | 1060 | 8 | 850 |
| M 4 | 4.0  | 0.50 | 12 | 955  | 10 | 795  | 8 | 635 |
| M 5 | 5.0  | 0.50 | 12 | 765  | 10 | 635  | 8 | 510 |
| M 6 | 6.0  | 0.50 | 12 | 635  | 10 | 530  | 8 | 425 |
| M 6 | 6.0  | 0.75 | 12 | 635  | 10 | 530  | 8 | 425 |
| M 8 | 8.0  | 0.75 | 12 | 475  | 10 | 400  | 8 | 320 |
| M10 | 10.0 | 0.75 | 12 | 380  | 10 | 320  | 8 | 255 |
| M 8 | 8.0  | 1.00 | 12 | 475  | 10 | 400  | 8 | 320 |
| M10 | 10.0 | 1.00 | 12 | 380  | 10 | 320  | 8 | 255 |

Aluminium corroyé  
Si < 6%  
trempé

|     |      |      |    |     |    |     |   |     |
|-----|------|------|----|-----|----|-----|---|-----|
| M12 | 12.0 | 1.00 | 12 | 320 | 10 | 265 | 8 | 210 |
| M14 | 14.0 | 1.00 | 12 | 275 | 10 | 225 | 8 | 180 |
| M16 | 16.0 | 1.00 | 12 | 240 | 10 | 200 | 8 | 160 |
| M10 | 10.0 | 1.25 | 12 | 380 | 10 | 320 | 8 | 255 |
| M12 | 12.0 | 1.25 | 12 | 320 | 10 | 265 | 8 | 210 |
| M12 | 12.0 | 1.50 | 12 | 320 | 10 | 265 | 8 | 210 |
| M14 | 14.0 | 1.50 | 12 | 275 | 10 | 225 | 8 | 180 |
| M16 | 16.0 | 1.50 | 12 | 240 | 10 | 200 | 8 | 160 |
| M20 | 20.0 | 1.50 | 12 | 190 | 10 | 160 | 8 | 125 |



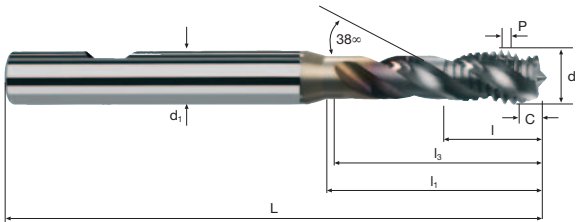


MF

ISO 2  
(6H)

HSS  
PM/F

Form C



MF

Rm  
< 850

Rm  
850-1100

Inox  
Stainless

GG(G)  
Aluminium

| Exemple: N° cde |     |      |     |    |    |    |          |   |       | TiCN   |   |
|-----------------|-----|------|-----|----|----|----|----------|---|-------|--------|---|
| N° d'article    |     |      |     |    |    |    |          |   |       | EH1229 |   |
| Code-ø          |     |      |     |    |    |    |          |   |       |        |   |
| Ø<br>Code       | d   | P    | L   | l  | l1 | l2 | d1<br>h6 |   |       |        |   |
| .031            | M 3 | 0.35 | 63  | 5  | 18 | 16 | 6        | 3 | 2.65  |        | ● |
| .046            | M 4 | 0.50 | 66  | 7  | 21 | 19 | 6        | 3 | 3.50  |        | ● |
| .048            | M 5 | 0.50 | 70  | 8  | 25 | 23 | 6        | 3 | 4.50  |        | ● |
| .050            | M 6 | 0.50 | 80  | 10 | 30 | 28 | 6        | 3 | 5.50  |        | ● |
| .064            | M 6 | 0.75 | 80  | 10 | 30 | 28 | 6        | 3 | 5.20  |        | ● |
| .066            | M 8 | 0.75 | 90  | 13 | 35 | 33 | 8        | 3 | 7.20  |        | ● |
| .068            | M10 | 0.75 | 100 | 15 | 39 | 37 | 10       | 3 | 9.20  |        | ● |
| .090            | M 8 | 1.00 | 90  | 13 | 35 | 37 | 8        | 3 | 7.00  |        | ● |
| .092            | M10 | 1.00 | 100 | 15 | 39 | 37 | 10       | 3 | 9.00  |        | ● |
| .094            | M12 | 1.00 | 110 | 11 | 39 | 37 | 12       | 3 | 11.00 |        | ● |
| .096            | M14 | 1.00 | 110 | 11 | 46 | 44 | 16       | 4 | 13.00 |        | ● |
| .098            | M16 | 1.00 | 110 | 12 | 50 | 48 | 16       | 4 | 15.00 |        | ● |
| .162            | M10 | 1.25 | 100 | 15 | 39 | 37 | 10       | 3 | 8.80  |        | ● |
| .164            | M12 | 1.25 | 110 | 15 | 39 | 37 | 12       | 3 | 10.80 |        | ● |
| .176            | M12 | 1.50 | 110 | 15 | 39 | 37 | 12       | 3 | 10.50 |        | ● |
| .178            | M14 | 1.50 | 110 | 15 | 46 | 44 | 16       | 4 | 12.50 |        | ● |
| .180            | M16 | 1.50 | 110 | 15 | 50 | 48 | 16       | 4 | 14.50 |        | ● |
| .184            | M20 | 1.50 | 140 | 20 | 64 | 62 | 16       | 4 | 18.50 |        | ● |
|                 |     |      |     |    |    |    |          |   |       |        |   |
|                 |     |      |     |    |    |    |          |   |       |        |   |
|                 |     |      |     |    |    |    |          |   |       |        |   |
|                 |     |      |     |    |    |    |          |   |       |        |   |
|                 |     |      |     |    |    |    |          |   |       |        |   |



# Filetage Whitworth pas de gaz cylindrique G

**G**

N° EH1400



N° EH11425

s-tap



N° EH1472

x-tap



N° EH1475

x-tap



N° EH1482



N° EH1495



N° EH6916



N° ET1440

Inotap



N° ET1475

x-tap



N° EH1480



N° EI1402



N° EI1452



N° EH1429

polytap-R



N° E11480

u-tap



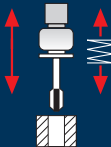
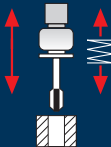
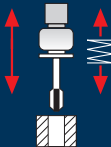
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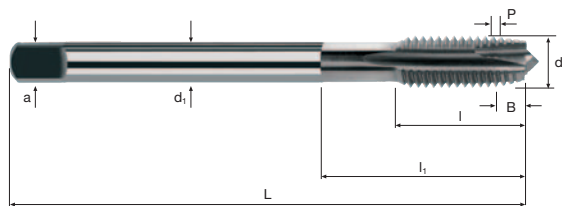
u-tap



|  |              |  |                          |                   |     |
|--|--------------|--|--------------------------|-------------------|-----|
|  | HSS<br>PM/F  |  | Rm<br><850               |                   | 273 |
|  | HSS-E<br>Co5 |  | Rm<br><850               |                   | 275 |
|  | HSS<br>PM/F  |  | Rm<br>850-1100           |                   | 277 |
|  | HSS<br>PM/F  |  | Rm<br>850-1100           |                   | 279 |
|  | HSS<br>PM/F  |  | Rm<br>1100-1500          |                   | 281 |
|  | HSS<br>PM/F  |  | Rm<br>1100-1500          |                   | 283 |
|  | HM<br>MG10   |  | HRC<br>48- >60           |                   | 285 |
|  | HSS<br>PM/F  |  | Inox<br>Stainless        |                   | 287 |
|  | HSS<br>PM/F  |  | Inox<br>Stainless        |                   | 289 |
|  | HSS<br>PM/F  |  | GG(G)<br>Cast iron       |                   | 291 |
|  | HSS<br>PM/F  |  | Al<br>Aluminium<br>Alloy | Cu<br>Copper      | 293 |
|  | HSS<br>PM/F  |  | Al<br>Aluminium<br>Alloy | Cu<br>Copper      | 295 |
|  | HSS<br>PM/F  |  | Rm<br><850-1100          | Inox<br>Stainless | 297 |
|  | HSS-E<br>Co5 |  | Rm<br><850               |                   | 299 |
|  | HSS-E<br>Co5 |  | Rm<br><850               |                   | 301 |

**G**

| Application                                                                       | Matières                  | <table><tr><th>G</th><th>ø<br/>[mm]</th><th>P<br/>[mm]</th><th><math>v_c</math><br/>1.5 x d<br/>[min<sup>-1</sup>]</th><th>n<br/>[100%]</th><th><math>v_f</math><br/>[100%]</th><th><math>v_c</math><br/>2.0 x d<br/>[min<sup>-1</sup>]</th><th>n<br/>[100%]</th><th><math>v_f</math><br/>[100%]</th><th><math>v_c</math><br/>3.0 x d<br/>[min<sup>-1</sup>]</th><th>n<br/>[100%]</th><th><math>v_f</math><br/>[100%]</th></tr><tr><td rowspan="10"></td><td rowspan="10">Aciers<br/>&lt; 500 N/mm²</td><td>G 1/8</td><td>9.728</td><td>0.907</td><td>28</td><td>915</td><td>830</td><td>23</td><td>755</td><td>685</td><td>18</td><td>590</td><td>535</td></tr><tr><td>G 1/4</td><td>13.157</td><td>1.337</td><td>28</td><td>675</td><td>902</td><td>23</td><td>555</td><td>742</td><td>18</td><td>435</td><td>582</td></tr><tr><td>G 3/8</td><td>16.662</td><td>1.337</td><td>28</td><td>535</td><td>715</td><td>23</td><td>440</td><td>588</td><td>18</td><td>345</td><td>461</td></tr><tr><td>G 1/2</td><td>20.955</td><td>1.814</td><td>28</td><td>425</td><td>771</td><td>23</td><td>350</td><td>635</td><td>18</td><td>275</td><td>499</td></tr><tr><td>G 5/8</td><td>22.911</td><td>1.814</td><td>28</td><td>390</td><td>707</td><td>23</td><td>320</td><td>580</td><td>18</td><td>250</td><td>454</td></tr><tr><td>G 3/4</td><td>26.441</td><td>1.814</td><td>28</td><td>335</td><td>608</td><td>23</td><td>275</td><td>499</td><td>18</td><td>215</td><td>390</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="10"></td><td rowspan="10">Aciers<br/>500 - 850 N/mm²</td><td>G 1/8</td><td>9.728</td><td>0.907</td><td>25</td><td>820</td><td>744</td><td>20</td><td>655</td><td>594</td><td>15</td><td>490</td><td>444</td></tr><tr><td>G 1/4</td><td>13.157</td><td>1.337</td><td>25</td><td>605</td><td>809</td><td>20</td><td>485</td><td>648</td><td>15</td><td>365</td><td>488</td></tr><tr><td>G 3/8</td><td>16.662</td><td>1.337</td><td>25</td><td>480</td><td>642</td><td>20</td><td>380</td><td>508</td><td>15</td><td>285</td><td>381</td></tr><tr><td>G 1/2</td><td>20.955</td><td>1.814</td><td>25</td><td>380</td><td>689</td><td>20</td><td>305</td><td>553</td><td>15</td><td>230</td><td>417</td></tr><tr><td>G 5/8</td><td>22.911</td><td>1.814</td><td>25</td><td>345</td><td>626</td><td>20</td><td>280</td><td>508</td><td>15</td><td>210</td><td>381</td></tr><tr><td>G 3/4</td><td>26.441</td><td>1.814</td><td>25</td><td>300</td><td>544</td><td>20</td><td>240</td><td>435</td><td>15</td><td>180</td><td>327</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="10"></td><td rowspan="10"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="10"></td><td rowspan="10"></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> |                                          |             |                 |                                          |             |                 |                                          |             |                 |     |     | G | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] | $v_c$<br>3.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] |  | Aciers<br>< 500 N/mm² | G 1/8 | 9.728 | 0.907 | 28 | 915 | 830 | 23 | 755 | 685 | 18 | 590 | 535 | G 1/4 | 13.157 | 1.337 | 28 | 675 | 902 | 23 | 555 | 742 | 18 | 435 | 582 | G 3/8 | 16.662 | 1.337 | 28 | 535 | 715 | 23 | 440 | 588 | 18 | 345 | 461 | G 1/2 | 20.955 | 1.814 | 28 | 425 | 771 | 23 | 350 | 635 | 18 | 275 | 499 | G 5/8 | 22.911 | 1.814 | 28 | 390 | 707 | 23 | 320 | 580 | 18 | 250 | 454 | G 3/4 | 26.441 | 1.814 | 28 | 335 | 608 | 23 | 275 | 499 | 18 | 215 | 390 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Aciers<br>500 - 850 N/mm² | G 1/8 | 9.728 | 0.907 | 25 | 820 | 744 | 20 | 655 | 594 | 15 | 490 | 444 | G 1/4 | 13.157 | 1.337 | 25 | 605 | 809 | 20 | 485 | 648 | 15 | 365 | 488 | G 3/8 | 16.662 | 1.337 | 25 | 480 | 642 | 20 | 380 | 508 | 15 | 285 | 381 | G 1/2 | 20.955 | 1.814 | 25 | 380 | 689 | 20 | 305 | 553 | 15 | 230 | 417 | G 5/8 | 22.911 | 1.814 | 25 | 345 | 626 | 20 | 280 | 508 | 15 | 210 | 381 | G 3/4 | 26.441 | 1.814 | 25 | 300 | 544 | 20 | 240 | 435 | 15 | 180 | 327 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| G                                                                                 | ø<br>[mm]                 | P<br>[mm]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              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$v_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] | $v_c$<br>3.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] |     |     |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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|  | Aciers<br>< 500 N/mm²     | G 1/8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 9.728                                    | 0.907       | 28              | 915                                      | 830         | 23              | 755                                      | 685         | 18              | 590 | 535 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |  |  |  |  |  |  |  |  |  |  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|                                                                                   |                           | G 1/4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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13.157                                   | 1.337       | 28              | 675                                      | 902         | 23              | 555                                      | 742         | 18              | 435 | 582 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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|                                                                                   |                           | G 3/8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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16.662                                   | 1.337       | 28              | 535                                      | 715         | 23              | 440                                      | 588         | 18              | 345 | 461 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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|                                                                                   |                           | G 1/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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20.955                                   | 1.814       | 28              | 425                                      | 771         | 23              | 350                                      | 635         | 18              | 275 | 499 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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|                                                                                   |                           | G 5/8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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22.911                                   | 1.814       | 28              | 390                                      | 707         | 23              | 320                                      | 580         | 18              | 250 | 454 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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|                                                                                   |                           | G 3/4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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26.441                                   | 1.814       | 28              | 335                                      | 608         | 23              | 275                                      | 499         | 18              | 215 | 390 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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|                                                                                   | Aciers<br>500 - 850 N/mm² | G 1/8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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9.728                                    | 0.907       | 25              | 820                                      | 744         | 20              | 655                                      | 594         | 15              | 490 | 444 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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|                                                                                   |                           | G 1/4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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13.157                                   | 1.337       | 25              | 605                                      | 809         | 20              | 485                                      | 648         | 15              | 365 | 488 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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|                                                                                   |                           | G 3/8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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16.662                                   | 1.337       | 25              | 480                                      | 642         | 20              | 380                                      | 508         | 15              | 285 | 381 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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|                                                                                   |                           | G 1/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  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20.955                                   | 1.814       | 25              | 380                                      | 689         | 20              | 305                                      | 553         | 15              | 230 | 417 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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22.911                                   | 1.814       | 25              | 345                                      | 626         | 20              | 280                                      | 508         | 15              | 210 | 381 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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26.441                                   | 1.814       | 25              | 300                                      | 544         | 20              | 240                                      | 435         | 15              | 180 | 327 |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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                                         |             |                 |                                          |             |                 |                                          |             |                 |     |     |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       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                                         |             |                 |                                          |             |                 |                                          |             |                 |     |     |   |           |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |                                                                                   |                       |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                           |       |       |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |       |        |       |    |     |     |    |     |     |    |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 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**Rm**  
850-1100

273

| Application | Matières                              | G     | ø<br>[mm] | P<br>[mm] | $v_c$<br>$1.0 \times d$ | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>$1.5 \times d$ | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>$2.0 \times d$ | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-------------|---------------------------------------|-------|-----------|-----------|-------------------------|---------------------------|-----------------|-------------------------|---------------------------|-----------------|-------------------------|---------------------------|-----------------|
|             | Aciers<br>< 500 N/mm <sup>2</sup>     | G 1/8 | 9.728     | 0.907     | 25                      | 820                       | 744             | 20                      | 655                       | 594             | 18                      | 590                       | 535             |
|             |                                       | G 1/4 | 13.157    | 1.337     | 25                      | 605                       | 809             | 20                      | 485                       | 648             | 18                      | 435                       | 582             |
|             |                                       | G 3/8 | 16.662    | 1.337     | 25                      | 480                       | 642             | 20                      | 380                       | 508             | 18                      | 345                       | 461             |
|             |                                       | G 1/2 | 20.955    | 1.814     | 25                      | 380                       | 689             | 20                      | 305                       | 553             | 18                      | 275                       | 499             |
|             |                                       | G 5/8 | 22.911    | 1.814     | 25                      | 345                       | 626             | 20                      | 280                       | 508             | 18                      | 250                       | 454             |
|             |                                       | G 3/4 | 26.441    | 1.814     | 25                      | 300                       | 544             | 20                      | 240                       | 435             | 18                      | 215                       | 390             |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             | Aciers<br>500 - 850 N/mm <sup>2</sup> | G 1/8 | 9.728     | 0.907     | 16                      | 525                       | 476             | 14                      | 460                       | 417             | 12                      | 395                       | 358             |
|             |                                       | G 1/4 | 13.157    | 1.337     | 16                      | 385                       | 515             | 14                      | 340                       | 455             | 12                      | 290                       | 388             |
|             |                                       | G 3/8 | 16.662    | 1.337     | 16                      | 305                       | 408             | 14                      | 265                       | 354             | 12                      | 230                       | 308             |
|             |                                       | G 1/2 | 20.955    | 1.814     | 16                      | 245                       | 444             | 14                      | 215                       | 390             | 12                      | 180                       | 327             |
|             |                                       | G 5/8 | 22.911    | 1.814     | 16                      | 220                       | 399             | 14                      | 195                       | 354             | 12                      | 165                       | 299             |
|             |                                       | G 3/4 | 26.441    | 1.814     | 16                      | 195                       | 354             | 14                      | 170                       | 308             | 12                      | 145                       | 263             |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |
|             |                                       |       |           |           |                         |                           |                 |                         |                           |                 |                         |                           |                 |

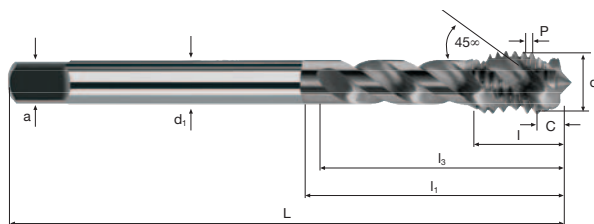
## G



**HSS-E**  
**Co5**



Form C

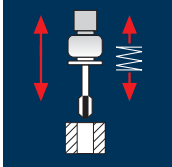


**Rm**  
**< 850**

**Rm**  
850-1100

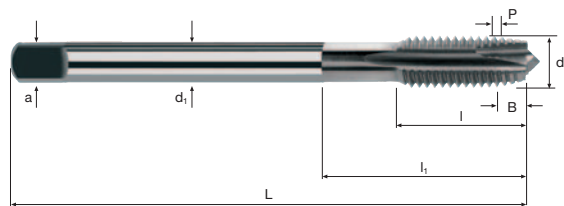
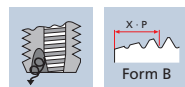
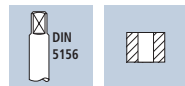
# G

[illegible]

| Application                                                                       | Matières                    |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |
|-----------------------------------------------------------------------------------|-----------------------------|-------|-----------|-----------|---------------------------------|-----|-----|---------------------------------|-----|-----|---------------------------------|-----|-----|
|   | Aciers<br>500 - 850 N/mm²   | G     | ø<br>[mm] | P<br>[mm] | Vc<br>1.5 x d<br>[min⁻¹] [100%] |     |     | Vc<br>2.0 x d<br>[min⁻¹] [100%] |     |     | Vc<br>3.0 x d<br>[min⁻¹] [100%] |     |     |
|                                                                                   |                             | G 1/8 | 9.728     | 0.907     | 25                              | 820 | 744 | 20                              | 655 | 594 | 15                              | 490 | 444 |
|                                                                                   |                             | G 1/4 | 13.157    | 1.337     | 25                              | 605 | 809 | 20                              | 485 | 648 | 15                              | 365 | 488 |
|                                                                                   |                             | G 3/8 | 16.662    | 1.337     | 25                              | 480 | 642 | 20                              | 380 | 508 | 15                              | 285 | 381 |
|                                                                                   |                             | G 1/2 | 20.955    | 1.814     | 25                              | 380 | 689 | 20                              | 305 | 553 | 15                              | 230 | 411 |
|                                                                                   |                             | G 5/8 | 22.911    | 1.814     | 25                              | 345 | 626 | 20                              | 280 | 508 | 15                              | 210 | 381 |
|                                                                                   |                             | G 3/4 | 26.441    | 1.814     | 25                              | 300 | 544 | 20                              | 240 | 435 | 15                              | 180 | 327 |
|                                                                                   |                             |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |
|                                                                                   |                             |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |
|                                                                                   |                             |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |
|                                                                                   | Aciers<br>850 - 1100 N/mm²  | G 1/8 | 9.728     | 0.907     | 20                              | 655 | 594 | 15                              | 490 | 444 | 12                              | 395 | 358 |
|                                                                                   |                             | G 1/4 | 13.157    | 1.337     | 20                              | 485 | 648 | 15                              | 365 | 488 | 12                              | 290 | 388 |
|                                                                                   |                             | G 3/8 | 16.662    | 1.337     | 20                              | 380 | 508 | 15                              | 285 | 381 | 12                              | 230 | 308 |
|                                                                                   |                             | G 1/2 | 20.955    | 1.814     | 20                              | 305 | 553 | 15                              | 230 | 417 | 12                              | 180 | 327 |
|                                                                                   |                             | G 5/8 | 22.911    | 1.814     | 20                              | 280 | 508 | 15                              | 210 | 381 | 12                              | 165 | 299 |
|                                                                                   |                             | G 3/4 | 26.441    | 1.814     | 20                              | 240 | 435 | 15                              | 180 | 327 | 12                              | 145 | 263 |
|                                                                                   |                             |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |
|                                                                                   |                             |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |
|                                                                                   |                             |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |
|                                                                                   |                             |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |
|  | Aciers<br>1100 - 1300 N/mm² | G 1/8 | 9.728     | 0.907     | 7                               | 230 | 209 | 4                               | 130 | 118 |                                 |     |     |
|                                                                                   |                             | G 1/4 | 13.157    | 1.337     | 7                               | 170 | 227 | 4                               | 95  | 127 |                                 |     |     |
|                                                                                   |                             | G 3/8 | 16.662    | 1.337     | 7                               | 135 | 180 | 4                               | 75  | 100 |                                 |     |     |
|                                                                                   |                             | G 1/2 | 20.955    | 1.814     | 7                               | 105 | 190 | 4                               | 60  | 109 |                                 |     |     |
|                                                                                   |                             | G 5/8 | 22.911    | 1.814     | 7                               | 95  | 172 | 4                               | 55  | 100 |                                 |     |     |
|                                                                                   |                             | G 3/4 | 26.441    | 1.814     | 7                               | 85  | 154 | 4                               | 50  | 91  |                                 |     |     |
|                                                                                   |                             |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |
|                                                                                   |                             |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |
|                                                                                   |                             |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |
|                                                                                   |                             |       |           |           |                                 |     |     |                                 |     |     |                                 |     |     |



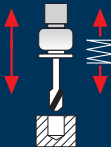
11



# G

**Rm**  
1100-1300

[illegible]

| Application                                                                       | Matières                               | <table><tr><th>G</th><th>ø<br/>[mm]</th><th>P<br/>[mm]</th><th><math>v_c</math><br/>1.0 x d<br/>[min<sup>-1</sup>]</th><th><math>v_f</math><br/>[100%]</th><th><math>v_c</math><br/>1.5 x d<br/>[min<sup>-1</sup>]</th><th>n<br/>[min<sup>-1</sup>]</th><th><math>v_f</math><br/>[100%]</th><th><math>v_c</math><br/>2.0 x d<br/>[min<sup>-1</sup>]</th><th>n<br/>[min<sup>-1</sup>]</th><th><math>v_f</math><br/>[100%]</th></tr></table> |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     | G | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-----------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------|------------------------------------------|---------------------------|-----------------|------------------------------------------|---------------------------|-----------------|----|-----|-----|---|-----------|-----------|------------------------------------------|-----------------|------------------------------------------|---------------------------|-----------------|------------------------------------------|---------------------------|-----------------|
| G                                                                                 | ø<br>[mm]                              | P<br>[mm]                                                                                                                                                                                                                                                                                                                                                                                                                                  | $v_c$<br>1.0 x d<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|  | Aciers<br>500 - 850 N/mm <sup>2</sup>  | G 1/8                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.728                                    | 0.907           | 32                                       | 1045                      | 948             | 28                                       | 915                       | 830             | 22 | 720 | 653 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        | G 1/4                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13.157                                   | 1.337           | 32                                       | 775                       | 1036            | 28                                       | 675                       | 902             | 22 | 530 | 709 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        | G 3/8                                                                                                                                                                                                                                                                                                                                                                                                                                      | 16.662                                   | 1.337           | 32                                       | 610                       | 816             | 28                                       | 535                       | 715             | 22 | 420 | 562 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        | G 1/2                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20.955                                   | 1.814           | 32                                       | 485                       | 880             | 28                                       | 425                       | 771             | 22 | 335 | 608 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        | G 5/8                                                                                                                                                                                                                                                                                                                                                                                                                                      | 22.911                                   | 1.814           | 32                                       | 445                       | 807             | 28                                       | 390                       | 707             | 22 | 305 | 553 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        | G 3/4                                                                                                                                                                                                                                                                                                                                                                                                                                      | 26.441                                   | 1.814           | 32                                       | 385                       | 698             | 28                                       | 335                       | 608             | 22 | 265 | 481 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   | Aciers<br>850 - 1100 N/mm <sup>2</sup> | G 1/8                                                                                                                                                                                                                                                                                                                                                                                                                                      | 9.728                                    | 0.907           | 20                                       | 655                       | 594             | 16                                       | 525                       | 476             | 10 | 325 | 295 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        | G 1/4                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13.157                                   | 1.337           | 20                                       | 485                       | 648             | 16                                       | 385                       | 515             | 10 | 240 | 321 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        | G 3/8                                                                                                                                                                                                                                                                                                                                                                                                                                      | 16.662                                   | 1.337           | 20                                       | 380                       | 508             | 16                                       | 305                       | 408             | 10 | 190 | 254 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        | G 1/2                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20.955                                   | 1.814           | 20                                       | 305                       | 553             | 16                                       | 245                       | 444             | 10 | 150 | 272 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        | G 5/8                                                                                                                                                                                                                                                                                                                                                                                                                                      | 22.911                                   | 1.814           | 20                                       | 280                       | 508             | 16                                       | 220                       | 399             | 10 | 140 | 254 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        | G 3/4                                                                                                                                                                                                                                                                                                                                                                                                                                      | 26.441                                   | 1.814           | 20                                       | 240                       | 435             | 16                                       | 195                       | 354             | 10 | 120 | 218 |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                 |                                          |                           |                 |                                          |                           |                 |    |     |     |   |           |           |                                          |                 |                                          |                           |                 |                                          |                           |                 |

## G



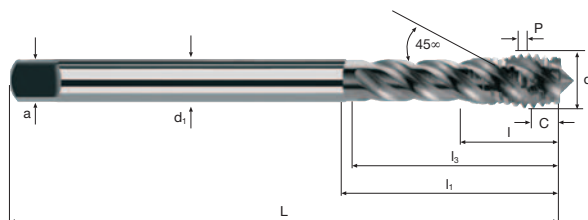
**HSS  
PM/F**



A cross-sectional diagram of a butt joint. Two plates, represented by diagonal hatching, are joined by a square groove weld. The weld metal is shown as a solid white area filling the square groove. The root of the joint is indicated by a small gap at the bottom center.



Form C

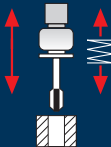


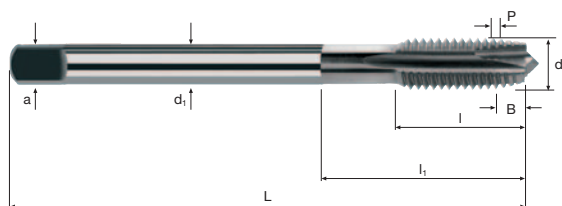
**Rm**  
**< 850**

**Rm**  
850-1100

**G**

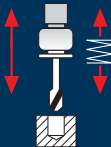
[illegible]

| Application                                                                       | Matières                                                                                                                                                                                                                  |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------|-----------|------------------------------------------|-----------------|------------------------------------------|-----------------|------------------------------------------|-----------------|---|-----|-----|
|  | <b>Aciers</b><br>1100 - 1300 N/mm <sup>2</sup><br><br>  | G     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           | G 1/8 | 9.728     | 0.907     | 10                                       | 325             | 295                                      | 8               | 260                                      | 236             | 5 | 165 | 150 |
|                                                                                   |                                                                                                                                                                                                                           | G 1/4 | 13.157    | 1.337     | 10                                       | 240             | 321                                      | 8               | 195                                      | 261             | 5 | 120 | 160 |
|                                                                                   |                                                                                                                                                                                                                           | G 3/8 | 16.662    | 1.337     | 10                                       | 190             | 254                                      | 8               | 155                                      | 207             | 5 | 95  | 127 |
|                                                                                   |                                                                                                                                                                                                                           | G 1/2 | 20.955    | 1.814     | 10                                       | 150             | 272                                      | 8               | 120                                      | 218             | 5 | 75  | 136 |
|                                                                                   |                                                                                                                                                                                                                           | G 5/8 | 22.911    | 1.814     | 10                                       | 140             | 254                                      | 8               | 110                                      | 200             | 5 | 70  | 127 |
|                                                                                   |                                                                                                                                                                                                                           | G 3/4 | 26.441    | 1.814     | 10                                       | 120             | 218                                      | 8               | 95                                       | 172             | 5 | 60  | 109 |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   | <b>Aciers</b><br>1300 - 1500 N/mm <sup>2</sup><br><br>  | G 1/8 | 9.728     | 0.907     | 6                                        | 195             | 177                                      | 4               | 130                                      | 118             | 3 | 100 | 91  |
|                                                                                   |                                                                                                                                                                                                                           | G 1/4 | 13.157    | 1.337     | 6                                        | 145             | 194                                      | 4               | 95                                       | 127             | 3 | 75  | 100 |
|                                                                                   |                                                                                                                                                                                                                           | G 3/8 | 16.662    | 1.337     | 6                                        | 115             | 154                                      | 4               | 75                                       | 100             | 3 | 55  | 74  |
|                                                                                   |                                                                                                                                                                                                                           | G 1/2 | 20.955    | 1.814     | 6                                        | 90              | 163                                      | 4               | 60                                       | 109             | 3 | 45  | 82  |
|                                                                                   |                                                                                                                                                                                                                           | G 5/8 | 22.911    | 1.814     | 6                                        | 85              | 154                                      | 4               | 55                                       | 100             | 3 | 40  | 73  |
|                                                                                   |                                                                                                                                                                                                                           | G 3/4 | 26.441    | 1.814     | 6                                        | 70              | 127                                      | 4               | 50                                       | 91              | 3 | 35  | 63  |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |
|                                                                                   |                                                                                                                                                                                                                           |       |           |           |                                          |                 |                                          |                 |                                          |                 |   |     |     |



| Rm                                                                  | Rm                                                                  |
|---------------------------------------------------------------------|---------------------------------------------------------------------|
| 1100-1300                                                           | 1300-1500                                                           |
| <p>1100-1150</p> <p>1150-1200</p> <p>1200-1250</p> <p>1250-1300</p> | <p>1300-1350</p> <p>1350-1400</p> <p>1400-1450</p> <p>1450-1500</p> |

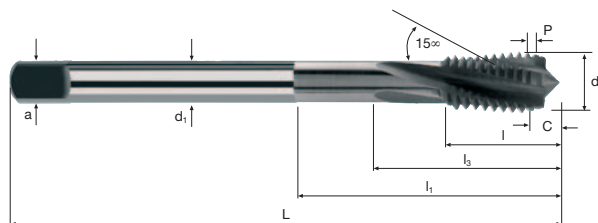
281

| Application                                                                       | Matières                                                                                                                                                                                               |       |        |         |         |        |         |         |        |       |  |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|---------|---------|--------|---------|---------|--------|-------|--|
|  | Aciers<br>1100 - 1300 N/mm²<br><br>  | G     | ø      | P       | $v_c$   | n      | $v_f$   | $v_c$   | n      | $v_f$ |  |
|                                                                                   |                                                                                                                                                                                                        | [mm]  | [mm]   | 1.0 x d | [min⁻¹] | [100%] | 1.5 x d | [min⁻¹] | [100%] |       |  |
|                                                                                   |                                                                                                                                                                                                        | G 1/8 | 9.728  | 0.907   | 6       | 195    | 177     | 5       | 165    | 150   |  |
|                                                                                   |                                                                                                                                                                                                        | G 1/4 | 13.157 | 1.337   | 6       | 145    | 194     | 5       | 120    | 160   |  |
|                                                                                   |                                                                                                                                                                                                        | G 3/8 | 16.662 | 1.337   | 6       | 115    | 154     | 5       | 95     | 127   |  |
|                                                                                   |                                                                                                                                                                                                        | G 1/2 | 20.955 | 1.814   | 6       | 90     | 163     | 5       | 75     | 136   |  |
|                                                                                   |                                                                                                                                                                                                        | G 5/8 | 22.911 | 1.814   | 6       | 85     | 154     | 5       | 70     | 127   |  |
|                                                                                   |                                                                                                                                                                                                        | G 3/4 | 26.441 | 1.814   | 6       | 70     | 127     | 5       | 60     | 109   |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   | Aciers<br>1300 - 1500 N/mm²<br><br>  | G 1/8 | 9.728  | 0.907   | 5       | 165    | 150     | 4       | 130    | 118   |  |
|                                                                                   |                                                                                                                                                                                                        | G 1/4 | 13.157 | 1.337   | 5       | 120    | 160     | 4       | 95     | 127   |  |
|                                                                                   |                                                                                                                                                                                                        | G 3/8 | 16.662 | 1.337   | 5       | 95     | 127     | 4       | 75     | 100   |  |
|                                                                                   |                                                                                                                                                                                                        | G 1/2 | 20.955 | 1.814   | 5       | 75     | 136     | 4       | 60     | 109   |  |
|                                                                                   |                                                                                                                                                                                                        | G 5/8 | 22.911 | 1.814   | 5       | 70     | 127     | 4       | 55     | 100   |  |
|                                                                                   |                                                                                                                                                                                                        | G 3/4 | 26.441 | 1.814   | 5       | 60     | 109     | 4       | 50     | 91    |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |
|                                                                                   |                                                                                                                                                                                                        |       |        |         |         |        |         |         |        |       |  |

**HSS  
PM/F**

DIN  
5156

Form C



# G

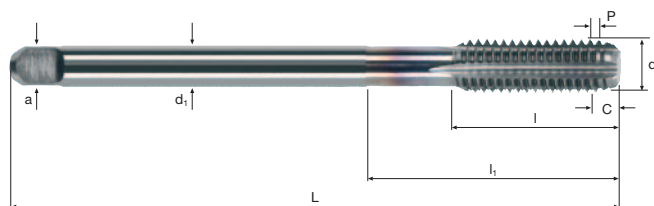
**Rm**  
1100-1300

**Rm**  
1300-1500

283

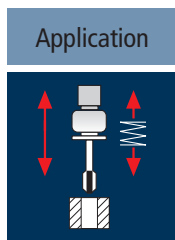






**HRC**  
**> 60**

285



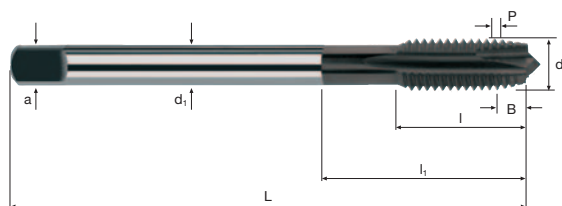
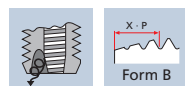
| Application | Matières                                       |
|-------------|------------------------------------------------|
|             | Aciers inoxydables<br>ferritique/martensitique |
|             |                                                |

|                                      |  |
|--------------------------------------|--|
| Aciers inoxydables<br>[Cr-Ni/1.4301] |  |
|--------------------------------------|--|

|                                             |  |
|---------------------------------------------|--|
| Aciers inoxydables<br>[Cr-Ni-Mo-.../1.4571] |  |
|---------------------------------------------|--|

|                                  |  |
|----------------------------------|--|
| Aciers réfractaires<br>[17-4 PH] |  |
|----------------------------------|--|

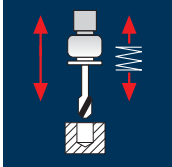
| G     | ø      | P     | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  |
|-------|--------|-------|----------------|----------------------|--------|----------------|----------------------|--------|----------------|----------------------|--------|
|       | [mm]   | [mm]  | $1.5 \times d$ | [min <sup>-1</sup> ] | [100%] | $2.0 \times d$ | [min <sup>-1</sup> ] | [100%] | $3.0 \times d$ | [min <sup>-1</sup> ] | [100%] |
| G 1/8 | 9.728  | 0.907 | 12             | 395                  | 358    | 10             | 325                  | 295    | 8              | 260                  | 236    |
| G 1/4 | 13.157 | 1.337 | 12             | 290                  | 388    | 10             | 240                  | 321    | 8              | 195                  | 261    |
| G 3/8 | 16.662 | 1.337 | 12             | 230                  | 308    | 10             | 190                  | 254    | 8              | 155                  | 207    |
| G 1/2 | 20.955 | 1.814 | 12             | 180                  | 327    | 10             | 150                  | 272    | 8              | 120                  | 218    |
| G 5/8 | 22.911 | 1.814 | 12             | 165                  | 299    | 10             | 140                  | 254    | 8              | 110                  | 200    |
| G 3/4 | 26.441 | 1.814 | 12             | 145                  | 263    | 10             | 120                  | 218    | 8              | 95                   | 172    |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
| G 1/8 | 9.728  | 0.907 | 7              | 230                  | 209    | 5              | 165                  | 150    | 4              | 130                  | 118    |
| G 1/4 | 13.157 | 1.337 | 7              | 170                  | 227    | 5              | 120                  | 160    | 4              | 95                   | 127    |
| G 3/8 | 16.662 | 1.337 | 7              | 135                  | 180    | 5              | 95                   | 127    | 4              | 75                   | 100    |
| G 1/2 | 20.955 | 1.814 | 7              | 105                  | 190    | 5              | 75                   | 136    | 4              | 60                   | 109    |
| G 5/8 | 22.911 | 1.814 | 7              | 95                   | 172    | 5              | 70                   | 127    | 4              | 55                   | 100    |
| G 3/4 | 26.441 | 1.814 | 7              | 85                   | 154    | 5              | 60                   | 109    | 4              | 50                   | 91     |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
| G 1/8 | 9.728  | 0.907 | 8              | 260                  | 236    | 6              | 195                  | 177    | 5              | 165                  | 150    |
| G 1/4 | 13.157 | 1.337 | 8              | 195                  | 261    | 6              | 145                  | 194    | 5              | 120                  | 160    |
| G 3/8 | 16.662 | 1.337 | 8              | 155                  | 207    | 6              | 115                  | 154    | 5              | 95                   | 127    |
| G 1/2 | 20.955 | 1.814 | 8              | 120                  | 218    | 6              | 90                   | 163    | 5              | 75                   | 136    |
| G 5/8 | 22.911 | 1.814 | 8              | 110                  | 200    | 6              | 85                   | 154    | 5              | 70                   | 127    |
| G 3/4 | 26.441 | 1.814 | 8              | 95                   | 172    | 6              | 70                   | 127    | 5              | 60                   | 109    |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
| G 1/8 | 9.728  | 0.907 | 5              | 165                  | 150    | 4              | 130                  | 118    | 3              | 100                  | 91     |
| G 1/4 | 13.157 | 1.337 | 5              | 120                  | 160    | 4              | 95                   | 127    | 3              | 75                   | 100    |
| G 3/8 | 16.662 | 1.337 | 5              | 95                   | 127    | 4              | 75                   | 100    | 3              | 55                   | 74     |
| G 1/2 | 20.955 | 1.814 | 5              | 75                   | 136    | 4              | 60                   | 109    | 3              | 45                   | 82     |
| G 5/8 | 22.911 | 1.814 | 5              | 70                   | 127    | 4              | 55                   | 100    | 3              | 40                   | 73     |
| G 3/4 | 26.441 | 1.814 | 5              | 60                   | 109    | 4              | 50                   | 91     | 3              | 35                   | 63     |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |

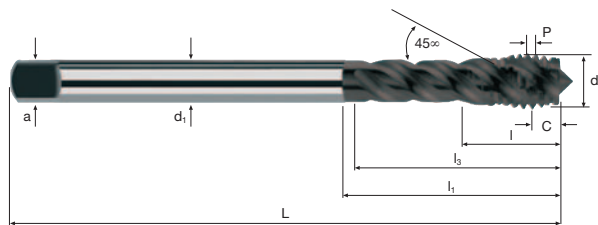


**Inox**  
Stainless

**G**

[illegible]

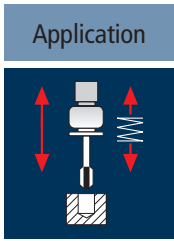
| Application                                                                                                                                                                                                 | Matières                                                                                                                                | G      | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------|-----------|-----------|------------------------------------------|-----------------|------------------------------------------|-----------------|------------------------------------------|-----------------|
|                                                                                                                             | Aciers inoxydables<br>ferritique/martensitique<br><br> | G 1/8  | 9.728     | 0.907     | 10                                       | 325             | 295                                      | 8               | 260                                      | 236             |
|                                                                                                                                                                                                             |                                                                                                                                         | G 1/4  | 13.157    | 1.337     | 10                                       | 240             | 321                                      | 8               | 195                                      | 261             |
|                                                                                                                                                                                                             |                                                                                                                                         | G 3/8  | 16.662    | 1.337     | 10                                       | 190             | 254                                      | 8               | 155                                      | 207             |
|                                                                                                                                                                                                             |                                                                                                                                         | G 1/2  | 20.955    | 1.814     | 10                                       | 150             | 272                                      | 8               | 120                                      | 218             |
|                                                                                                                                                                                                             |                                                                                                                                         | G 5/8  | 22.911    | 1.814     | 10                                       | 140             | 254                                      | 8               | 110                                      | 200             |
|                                                                                                                                                                                                             |                                                                                                                                         | G 3/4  | 26.441    | 1.814     | 10                                       | 120             | 218                                      | 8               | 95                                       | 172             |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
| Aciers inoxydables<br>[Cr-Ni/1.4301]<br><br>                                                                               | G 1/8                                                                                                                                   | 9.728  | 0.907     | 5         | 165                                      | 150             | 4                                        | 130             | 118                                      |                 |
|                                                                                                                                                                                                             | G 1/4                                                                                                                                   | 13.157 | 1.337     | 5         | 120                                      | 160             | 4                                        | 95              | 127                                      |                 |
|                                                                                                                                                                                                             | G 3/8                                                                                                                                   | 16.662 | 1.337     | 5         | 95                                       | 127             | 4                                        | 75              | 100                                      |                 |
|                                                                                                                                                                                                             | G 1/2                                                                                                                                   | 20.955 | 1.814     | 5         | 75                                       | 136             | 4                                        | 60              | 109                                      |                 |
|                                                                                                                                                                                                             | G 5/8                                                                                                                                   | 22.911 | 1.814     | 5         | 70                                       | 127             | 4                                        | 55              | 100                                      |                 |
|                                                                                                                                                                                                             | G 3/4                                                                                                                                   | 26.441 | 1.814     | 5         | 60                                       | 109             | 4                                        | 50              | 91                                       |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
| Aciers inoxydables<br>[Cr-Ni-Mo-.../1.4571]<br><br>                                                                        | G 1/8                                                                                                                                   | 9.728  | 0.907     | 6         | 195                                      | 177             | 5                                        | 165             | 150                                      |                 |
|                                                                                                                                                                                                             | G 1/4                                                                                                                                   | 13.157 | 1.337     | 6         | 145                                      | 194             | 5                                        | 120             | 160                                      |                 |
|                                                                                                                                                                                                             | G 3/8                                                                                                                                   | 16.662 | 1.337     | 6         | 115                                      | 154             | 5                                        | 95              | 127                                      |                 |
|                                                                                                                                                                                                             | G 1/2                                                                                                                                   | 20.955 | 1.814     | 6         | 90                                       | 163             | 5                                        | 75              | 136                                      |                 |
|                                                                                                                                                                                                             | G 5/8                                                                                                                                   | 22.911 | 1.814     | 6         | 85                                       | 154             | 5                                        | 70              | 127                                      |                 |
|                                                                                                                                                                                                             | G 3/4                                                                                                                                   | 26.441 | 1.814     | 6         | 70                                       | 127             | 5                                        | 60              | 109                                      |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
| Aciers réfractaires<br>[17-4 PH]<br><br>  | G 1/8                                                                                                                                   | 9.728  | 0.907     | 4         | 130                                      | 118             | 3                                        | 100             | 91                                       |                 |
|                                                                                                                                                                                                             | G 1/4                                                                                                                                   | 13.157 | 1.337     | 4         | 95                                       | 127             | 3                                        | 75              | 100                                      |                 |
|                                                                                                                                                                                                             | G 3/8                                                                                                                                   | 16.662 | 1.337     | 4         | 75                                       | 100             | 3                                        | 55              | 74                                       |                 |
|                                                                                                                                                                                                             | G 1/2                                                                                                                                   | 20.955 | 1.814     | 4         | 60                                       | 109             | 3                                        | 45              | 82                                       |                 |
|                                                                                                                                                                                                             | G 5/8                                                                                                                                   | 22.911 | 1.814     | 4         | 55                                       | 100             | 3                                        | 40              | 73                                       |                 |
|                                                                                                                                                                                                             | G 3/4                                                                                                                                   | 26.441 | 1.814     | 4         | 50                                       | 91              | 3                                        | 35              | 63                                       |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |
|                                                                                                                                                                                                             |                                                                                                                                         |        |           |           |                                          |                 |                                          |                 |                                          |                 |



**Inox**  
Stainless

**G**

289



Application

Matières

Fonte  
GG

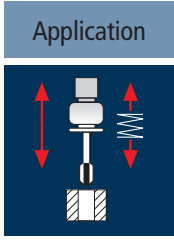
| G     | ø      | P     | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  |
|-------|--------|-------|----------------|----------------------|--------|----------------|----------------------|--------|----------------|----------------------|--------|
| [mm]  | [mm]   |       | $1.0 \times d$ | [min <sup>-1</sup> ] | [100%] | $1.5 \times d$ | [min <sup>-1</sup> ] | [100%] | $2.0 \times d$ | [min <sup>-1</sup> ] | [100%] |
| G 1/8 | 9.728  | 0.907 | 28             | 915                  | 830    | 24             | 785                  | 712    | 20             | 655                  | 594    |
| G 1/4 | 13.157 | 1.337 | 28             | 675                  | 902    | 24             | 580                  | 775    | 20             | 485                  | 648    |
| G 3/8 | 16.662 | 1.337 | 28             | 535                  | 715    | 24             | 460                  | 615    | 20             | 380                  | 508    |
| G 1/2 | 20.955 | 1.814 | 28             | 425                  | 771    | 24             | 365                  | 662    | 20             | 305                  | 553    |
| G 5/8 | 22.911 | 1.814 | 28             | 390                  | 707    | 24             | 335                  | 608    | 20             | 280                  | 508    |
| G 3/4 | 26.441 | 1.814 | 28             | 335                  | 608    | 24             | 290                  | 526    | 20             | 240                  | 435    |

Fonte  
GGG

|       |        |       |    |     |     |    |     |     |    |     |     |
|-------|--------|-------|----|-----|-----|----|-----|-----|----|-----|-----|
| G 1/8 | 9.728  | 0.907 | 20 | 655 | 594 | 18 | 590 | 535 | 15 | 490 | 444 |
| G 1/4 | 13.157 | 1.337 | 20 | 485 | 648 | 18 | 435 | 582 | 15 | 365 | 488 |
| G 3/8 | 16.662 | 1.337 | 20 | 380 | 508 | 18 | 345 | 461 | 15 | 285 | 381 |
| G 1/2 | 20.955 | 1.814 | 20 | 305 | 553 | 18 | 275 | 499 | 15 | 230 | 417 |
| G 5/8 | 22.911 | 1.814 | 20 | 280 | 508 | 18 | 250 | 454 | 15 | 210 | 381 |
| G 3/4 | 26.441 | 1.814 | 20 | 240 | 435 | 18 | 215 | 390 | 15 | 180 | 327 |

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Application

Matières

Fonte  
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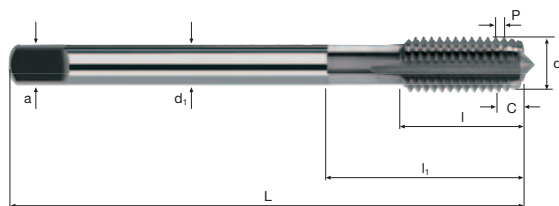
| G     | ø      | P     | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  |
|-------|--------|-------|----------------|----------------------|--------|----------------|----------------------|--------|----------------|----------------------|--------|
| [mm]  | [mm]   |       | $1.5 \times d$ | [min <sup>-1</sup> ] | [100%] | $2.0 \times d$ | [min <sup>-1</sup> ] | [100%] | $3.0 \times d$ | [min <sup>-1</sup> ] | [100%] |
| G 1/8 | 9.728  | 0.907 | 30             | 980                  | 889    | 28             | 915                  | 830    | 25             | 820                  | 744    |
| G 1/4 | 13.157 | 1.337 | 30             | 725                  | 969    | 28             | 675                  | 902    | 25             | 605                  | 809    |
| G 3/8 | 16.662 | 1.337 | 30             | 575                  | 769    | 28             | 535                  | 715    | 25             | 480                  | 642    |
| G 1/2 | 20.955 | 1.814 | 30             | 455                  | 825    | 28             | 425                  | 771    | 25             | 380                  | 689    |
| G 5/8 | 22.911 | 1.814 | 30             | 415                  | 753    | 28             | 390                  | 707    | 25             | 345                  | 626    |
| G 3/4 | 26.441 | 1.814 | 30             | 360                  | 653    | 28             | 335                  | 608    | 25             | 300                  | 544    |

Fonte  
GGG

|       |        |       |    |     |     |    |     |     |    |     |     |
|-------|--------|-------|----|-----|-----|----|-----|-----|----|-----|-----|
| G 1/8 | 9.728  | 0.907 | 25 | 820 | 744 | 22 | 720 | 653 | 20 | 655 | 594 |
| G 1/4 | 13.157 | 1.337 | 25 | 605 | 809 | 22 | 530 | 709 | 20 | 485 | 648 |
| G 3/8 | 16.662 | 1.337 | 25 | 480 | 642 | 22 | 420 | 562 | 20 | 380 | 508 |
| G 1/2 | 20.955 | 1.814 | 25 | 380 | 689 | 22 | 335 | 608 | 20 | 305 | 553 |
| G 5/8 | 22.911 | 1.814 | 25 | 345 | 626 | 22 | 305 | 553 | 20 | 280 | 508 |
| G 3/4 | 26.441 | 1.814 | 25 | 300 | 544 | 22 | 265 | 481 | 20 | 240 | 435 |

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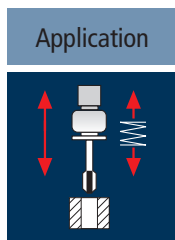
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# G

GG(G)

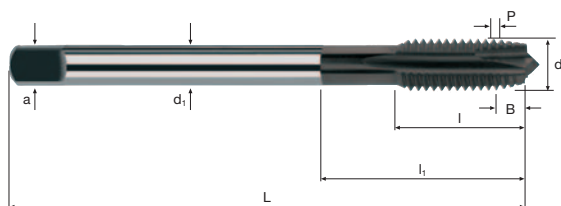
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| Application | Matières                                   |
|-------------|--------------------------------------------|
|             | Aluminium non-allié                        |
|             | Aluminium corroyé<br>Si < 6%<br>non trempé |
|             | Aluminium corroyé<br>Si < 6%<br>trempé     |
|             | Cuivre non-allié                           |

| G     | ø      | P     | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  | $v_c$   | n                    | $v_f$  |
|-------|--------|-------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|
|       | [mm]   | [mm]  | 1.5 x d | [min <sup>-1</sup> ] | [100%] | 2.0 x d | [min <sup>-1</sup> ] | [100%] | 3.0 x d | [min <sup>-1</sup> ] | [100%] |
| G 1/8 | 9.728  | 0.907 | 23      | 755                  | 685    | 19      | 620                  | 562    | 16      | 525                  | 476    |
| G 1/4 | 13.157 | 1.337 | 23      | 555                  | 742    | 19      | 460                  | 615    | 16      | 385                  | 515    |
| G 3/8 | 16.662 | 1.337 | 23      | 440                  | 588    | 19      | 365                  | 488    | 16      | 305                  | 408    |
| G 1/2 | 20.955 | 1.814 | 23      | 350                  | 635    | 19      | 290                  | 526    | 16      | 245                  | 444    |
| G 5/8 | 22.911 | 1.814 | 23      | 320                  | 580    | 19      | 265                  | 481    | 16      | 220                  | 399    |
| G 3/4 | 26.441 | 1.814 | 23      | 275                  | 499    | 19      | 230                  | 417    | 16      | 195                  | 354    |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |
| G 1/8 | 9.728  | 0.907 | 35      | 1145                 | 1039   | 30      | 980                  | 889    | 25      | 820                  | 744    |
| G 1/4 | 13.157 | 1.337 | 35      | 845                  | 1130   | 30      | 725                  | 969    | 25      | 605                  | 809    |
| G 3/8 | 16.662 | 1.337 | 35      | 670                  | 896    | 30      | 575                  | 769    | 25      | 480                  | 642    |
| G 1/2 | 20.955 | 1.814 | 35      | 530                  | 961    | 30      | 455                  | 825    | 25      | 380                  | 689    |
| G 5/8 | 22.911 | 1.814 | 35      | 485                  | 880    | 30      | 415                  | 753    | 25      | 345                  | 626    |
| G 3/4 | 26.441 | 1.814 | 35      | 420                  | 762    | 30      | 360                  | 653    | 25      | 300                  | 544    |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |
| G 1/8 | 9.728  | 0.907 | 20      | 655                  | 594    | 17      | 555                  | 503    | 14      | 460                  | 417    |
| G 1/4 | 13.157 | 1.337 | 20      | 485                  | 648    | 17      | 410                  | 548    | 14      | 340                  | 455    |
| G 3/8 | 16.662 | 1.337 | 20      | 380                  | 508    | 17      | 325                  | 435    | 14      | 265                  | 354    |
| G 1/2 | 20.955 | 1.814 | 20      | 305                  | 553    | 17      | 260                  | 472    | 14      | 215                  | 390    |
| G 5/8 | 22.911 | 1.814 | 20      | 280                  | 508    | 17      | 235                  | 426    | 14      | 195                  | 354    |
| G 3/4 | 26.441 | 1.814 | 20      | 240                  | 435    | 17      | 205                  | 372    | 14      | 170                  | 308    |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |
| G 1/8 | 9.728  | 0.907 | 21      | 685                  | 621    | 18      | 590                  | 535    | 15      | 490                  | 444    |
| G 1/4 | 13.157 | 1.337 | 21      | 510                  | 682    | 18      | 435                  | 582    | 15      | 365                  | 488    |
| G 3/8 | 16.662 | 1.337 | 21      | 400                  | 535    | 18      | 345                  | 461    | 15      | 285                  | 381    |
| G 1/2 | 20.955 | 1.814 | 21      | 320                  | 580    | 18      | 275                  | 499    | 15      | 230                  | 417    |
| G 5/8 | 22.911 | 1.814 | 21      | 290                  | 526    | 18      | 250                  | 454    | 15      | 210                  | 381    |
| G 3/4 | 26.441 | 1.814 | 21      | 255                  | 463    | 18      | 215                  | 390    | 15      | 180                  | 327    |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |
|       |        |       |         |                      |        |         |                      |        |         |                      |        |

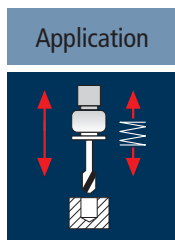




# G

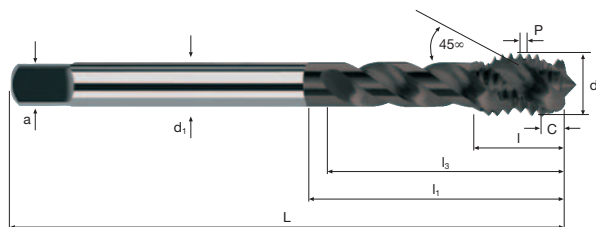
## Plastic Thermoplast

[illegible]



| Application | Matières                                   |
|-------------|--------------------------------------------|
|             | Aluminium non-allié                        |
|             | Aluminium corroyé<br>Si < 6%<br>non trempé |
|             | Aluminium corroyé<br>Si < 6%<br>trempé     |
|             | Cuivre non-allié                           |

| G     | ø      | P     | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  |
|-------|--------|-------|----------------|----------------------|--------|----------------|----------------------|--------|----------------|----------------------|--------|
|       | [mm]   | [mm]  | $1.0 \times d$ | [min <sup>-1</sup> ] | [100%] | $1.5 \times d$ | [min <sup>-1</sup> ] | [100%] | $2.0 \times d$ | [min <sup>-1</sup> ] | [100%] |
| G 1/8 | 9.728  | 0.907 | 15             | 490                  | 444    | 12             | 395                  | 358    | 10             | 325                  | 295    |
| G 1/4 | 13.157 | 1.337 | 15             | 365                  | 488    | 12             | 290                  | 388    | 10             | 240                  | 321    |
| G 3/8 | 16.662 | 1.337 | 15             | 285                  | 381    | 12             | 230                  | 308    | 10             | 190                  | 254    |
| G 1/2 | 20.955 | 1.814 | 15             | 230                  | 417    | 12             | 180                  | 327    | 10             | 150                  | 272    |
| G 5/8 | 22.911 | 1.814 | 15             | 210                  | 381    | 12             | 165                  | 299    | 10             | 140                  | 254    |
| G 3/4 | 26.441 | 1.814 | 15             | 180                  | 327    | 12             | 145                  | 263    | 10             | 120                  | 218    |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
| G 1/8 | 9.728  | 0.907 | 15             | 490                  | 444    | 13             | 425                  | 385    | 10             | 325                  | 295    |
| G 1/4 | 13.157 | 1.337 | 15             | 365                  | 488    | 13             | 315                  | 421    | 10             | 240                  | 321    |
| G 3/8 | 16.662 | 1.337 | 15             | 285                  | 381    | 13             | 250                  | 334    | 10             | 190                  | 254    |
| G 1/2 | 20.955 | 1.814 | 15             | 230                  | 417    | 13             | 195                  | 354    | 10             | 150                  | 272    |
| G 5/8 | 22.911 | 1.814 | 15             | 210                  | 381    | 13             | 180                  | 327    | 10             | 140                  | 254    |
| G 3/4 | 26.441 | 1.814 | 15             | 180                  | 327    | 13             | 155                  | 281    | 10             | 120                  | 218    |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
| G 1/8 | 9.728  | 0.907 | 13             | 425                  | 385    | 11             | 360                  | 327    | 10             | 325                  | 295    |
| G 1/4 | 13.157 | 1.337 | 13             | 315                  | 421    | 11             | 265                  | 354    | 10             | 240                  | 321    |
| G 3/8 | 16.662 | 1.337 | 13             | 250                  | 334    | 11             | 210                  | 281    | 10             | 190                  | 254    |
| G 1/2 | 20.955 | 1.814 | 13             | 195                  | 354    | 11             | 165                  | 299    | 10             | 150                  | 272    |
| G 5/8 | 22.911 | 1.814 | 13             | 180                  | 327    | 11             | 155                  | 281    | 10             | 140                  | 254    |
| G 3/4 | 26.441 | 1.814 | 13             | 155                  | 281    | 11             | 130                  | 236    | 10             | 120                  | 218    |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
| G 1/8 | 9.728  | 0.907 | 20             | 655                  | 594    | 18             | 590                  | 535    | 16             | 525                  | 476    |
| G 1/4 | 13.157 | 1.337 | 20             | 485                  | 648    | 18             | 435                  | 582    | 16             | 385                  | 515    |
| G 3/8 | 16.662 | 1.337 | 20             | 380                  | 508    | 18             | 345                  | 461    | 16             | 305                  | 408    |
| G 1/2 | 20.955 | 1.814 | 20             | 305                  | 553    | 18             | 275                  | 499    | 16             | 245                  | 444    |
| G 5/8 | 22.911 | 1.814 | 20             | 280                  | 508    | 18             | 250                  | 454    | 16             | 220                  | 399    |
| G 3/4 | 26.441 | 1.814 | 20             | 240                  | 435    | 18             | 215                  | 390    | 16             | 195                  | 354    |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |
|       |        |       |                |                      |        |                |                      |        |                |                      |        |



**G**

**Al**  
Aluminium  
> 99%

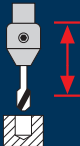
**Al**  
Aluminium  
Alloy

**Al**  
Aluminium  
Cast

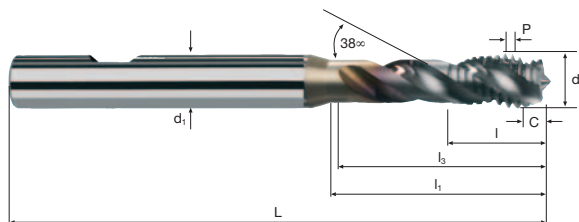
**Cu**  
Copper

## Plastic Thermoplast

[illegible]

| Application                                                                       | Matières                   |       |           |           |                           |                           |                           |                           |                           |                           |
|-----------------------------------------------------------------------------------|----------------------------|-------|-----------|-----------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
|  | Aciers<br>< 500 N/mm²      | G     | ø<br>[mm] | P<br>[mm] | V <sub>c</sub><br>1.0 x d | n<br>[min <sup>-1</sup> ] | V <sub>c</sub><br>1.5 x d | n<br>[min <sup>-1</sup> ] | V <sub>c</sub><br>2.0 x d | n<br>[min <sup>-1</sup> ] |
|                                                                                   |                            | G 1/8 | 9.728     | 0.907     | 25                        | 820                       | 22                        | 720                       | 15                        | 490                       |
|                                                                                   |                            | G 1/4 | 13.157    | 1.337     | 25                        | 605                       | 22                        | 530                       | 15                        | 365                       |
|                                                                                   |                            | G 3/8 | 16.662    | 1.337     | 25                        | 480                       | 22                        | 420                       | 15                        | 285                       |
|                                                                                   | Aciers<br>500 - 850 N/mm²  | G 1/2 | 20.955    | 1.814     | 25                        | 380                       | 22                        | 335                       | 15                        | 230                       |
|                                                                                   |                            | G 5/8 | 22.911    | 1.814     | 25                        | 345                       | 22                        | 305                       | 15                        | 210                       |
|                                                                                   |                            | G 3/4 | 26.441    | 1.814     | 25                        | 300                       | 22                        | 265                       | 15                        | 180                       |
|                                                                                   |                            |       |           |           |                           |                           |                           |                           |                           |                           |
|                                                                                   | Aciers<br>850 - 1100 N/mm² | G 1/8 | 9.728     | 0.907     | 22                        | 720                       | 20                        | 655                       | 12                        | 395                       |
|                                                                                   |                            | G 1/4 | 13.157    | 1.337     | 22                        | 530                       | 20                        | 485                       | 12                        | 290                       |
|                                                                                   |                            | G 3/8 | 16.662    | 1.337     | 22                        | 420                       | 20                        | 380                       | 12                        | 230                       |
|                                                                                   |                            | G 1/2 | 20.955    | 1.814     | 22                        | 335                       | 20                        | 305                       | 12                        | 180                       |
|                                                                                   | Fonte<br>GG(G)             | G 5/8 | 22.911    | 1.814     | 22                        | 305                       | 20                        | 280                       | 12                        | 165                       |
|                                                                                   |                            | G 3/4 | 26.441    | 1.814     | 22                        | 265                       | 20                        | 240                       | 12                        | 145                       |
|                                                                                   |                            |       |           |           |                           |                           |                           |                           |                           |                           |
|                                                                                   |                            |       |           |           |                           |                           |                           |                           |                           |                           |
|                                                                                   |                            | G 1/8 | 9.728     | 0.907     | 18                        | 590                       | 12                        | 395                       | 8                         | 260                       |
|                                                                                   |                            | G 1/4 | 13.157    | 1.337     | 18                        | 435                       | 12                        | 290                       | 8                         | 195                       |
|                                                                                   |                            | G 3/8 | 16.662    | 1.337     | 18                        | 345                       | 12                        | 230                       | 8                         | 155                       |
|                                                                                   |                            | G 1/2 | 20.955    | 1.814     | 18                        | 275                       | 12                        | 180                       | 8                         | 120                       |
|                                                                                   |                            | G 5/8 | 22.911    | 1.814     | 18                        | 250                       | 12                        | 165                       | 8                         | 110                       |
|                                                                                   |                            | G 3/4 | 26.441    | 1.814     | 18                        | 215                       | 12                        | 145                       | 8                         | 95                        |
|                                                                                   |                            |       |           |           |                           |                           |                           |                           |                           |                           |
|                                                                                   |                            |       |           |           |                           |                           |                           |                           |                           |                           |
|                                                                                   |                            | G 1/8 | 9.728     | 0.907     | 15                        | 490                       | 12                        | 395                       | 12                        | 395                       |
|                                                                                   |                            | G 1/4 | 13.157    | 1.337     | 15                        | 365                       | 12                        | 290                       | 12                        | 290                       |
|                                                                                   |                            | G 3/8 | 16.662    | 1.337     | 15                        | 285                       | 12                        | 230                       | 12                        | 230                       |
|                                                                                   |                            | G 1/2 | 20.955    | 1.814     | 15                        | 230                       | 12                        | 180                       | 12                        | 180                       |
|                                                                                   |                            | G 5/8 | 22.911    | 1.814     | 15                        | 210                       | 12                        | 165                       | 12                        | 165                       |
|                                                                                   |                            | G 3/4 | 26.441    | 1.814     | 15                        | 180                       | 12                        | 145                       | 12                        | 145                       |
|                                                                                   |                            |       |           |           |                           |                           |                           |                           |                           |                           |
|                                                                                   |                            |       |           |           |                           |                           |                           |                           |                           |                           |

| Matières |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|----------|----------------------------------------|-----------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|-----|
| G        | ø<br>[mm]                              | P<br>[mm] | V <sub>c</sub><br>1.0 x d | n<br>[min <sup>-1</sup> ] | V <sub>c</sub><br>1.5 x d | n<br>[min <sup>-1</sup> ] | V <sub>c</sub><br>2.0 x d | n<br>[min <sup>-1</sup> ] |   |     |
| G 1/8    | 9.728                                  | 0.907     | 4                         | 130                       | 3                         | 100                       | 2                         | 65                        |   |     |
| G 1/4    | 13.157                                 | 1.337     | 4                         | 95                        | 3                         | 75                        | 2                         | 50                        |   |     |
| G 3/8    | 16.662                                 | 1.337     | 4                         | 75                        | 3                         | 55                        | 2                         | 40                        |   |     |
| G 1/2    | 20.955                                 | 1.814     | 4                         | 60                        | 3                         | 45                        | 2                         | 30                        |   |     |
| G 5/8    | 22.911                                 | 1.814     | 4                         | 55                        | 3                         | 40                        | 2                         | 30                        |   |     |
| G 3/4    | 26.441                                 | 1.814     | 4                         | 50                        | 3                         | 35                        | 2                         | 25                        |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          | Aciers inoxydables<br>[Cr-Ni/1.4301]   | G 1/8     | 9.728                     | 0.907                     | 12                        | 395                       | 10                        | 325                       | 8 | 260 |
|          |                                        | G 1/4     | 13.157                    | 1.337                     | 12                        | 290                       | 10                        | 240                       | 8 | 195 |
|          |                                        | G 3/8     | 16.662                    | 1.337                     | 12                        | 230                       | 10                        | 190                       | 8 | 155 |
|          |                                        | G 1/2     | 20.955                    | 1.814                     | 12                        | 180                       | 10                        | 150                       | 8 | 120 |
|          | Aluminium corroyé<br>Si < 6%<br>trempé | G 5/8     | 22.911                    | 1.814                     | 12                        | 165                       | 10                        | 140                       | 8 | 110 |
|          |                                        | G 3/4     | 26.441                    | 1.814                     | 12                        | 145                       | 10                        | 120                       | 8 | 95  |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |
|          |                                        |           |                           |                           |                           |                           |                           |                           |   |     |



< 850

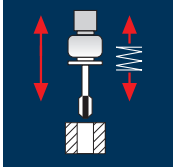
850-1100

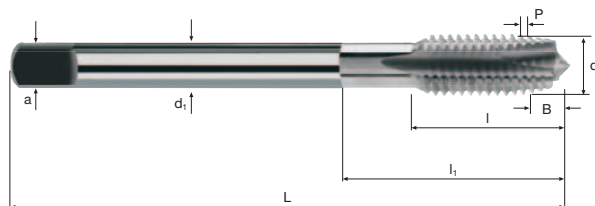
## Stainless

GG(G)  
Aluminium

## G

[www.fraisa.com](http://www.fraisa.com)

| Application                                                                       | Matières                               | <table><tr><th>G</th><th>ø<br/>[mm]</th><th>P<br/>[mm]</th><th>V<sub>c</sub><br/>1.5 x d<br/>[min<sup>-1</sup>]</th><th>n<br/>[100%]</th><th>v<sub>f</sub><br/>[100%]</th><th>V<sub>c</sub><br/>2.0 x d<br/>[min<sup>-1</sup>]</th><th>n<br/>[100%]</th><th>v<sub>f</sub><br/>[100%]</th><th>V<sub>c</sub><br/>3.0 x d<br/>[min<sup>-1</sup>]</th><th>n<br/>[100%]</th><th>v<sub>f</sub><br/>[100%]</th></tr></table> |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     | G | ø<br>[mm] | P<br>[mm] | V <sub>c</sub><br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | v <sub>f</sub><br>[100%] | V <sub>c</sub><br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | v <sub>f</sub><br>[100%] | V <sub>c</sub><br>3.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | v <sub>f</sub><br>[100%] |
|-----------------------------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------------|--------------------------|---------------------------------------------------|-------------|--------------------------|---------------------------------------------------|-------------|--------------------------|-----|-----|---|-----------|-----------|---------------------------------------------------|-------------|--------------------------|---------------------------------------------------|-------------|--------------------------|---------------------------------------------------|-------------|--------------------------|
| G                                                                                 | ø<br>[mm]                              | P<br>[mm]                                                                                                                                                                                                                                                                                                                                                                                                             | V <sub>c</sub><br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | v <sub>f</sub><br>[100%] | V <sub>c</sub><br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | v <sub>f</sub><br>[100%] | V <sub>c</sub><br>3.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | v <sub>f</sub><br>[100%] |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|   | Aciers<br>< 500 N/mm²                  | G 1/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 9.728                                             | 0.907       | 18                       | 590                                               | 535         | 15                       | 490                                               | 444         | 12                       | 395 | 358 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 1/4                                                                                                                                                                                                                                                                                                                                                                                                                 | 13.157                                            | 1.337       | 18                       | 435                                               | 582         | 15                       | 365                                               | 488         | 12                       | 290 | 388 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 3/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 16.662                                            | 1.337       | 18                       | 345                                               | 461         | 15                       | 285                                               | 381         | 12                       | 230 | 308 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 1/2                                                                                                                                                                                                                                                                                                                                                                                                                 | 20.955                                            | 1.814       | 18                       | 275                                               | 499         | 15                       | 230                                               | 417         | 12                       | 180 | 327 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 5/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 22.911                                            | 1.814       | 18                       | 250                                               | 454         | 15                       | 210                                               | 381         | 12                       | 165 | 299 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 3/4                                                                                                                                                                                                                                                                                                                                                                                                                 | 26.441                                            | 1.814       | 18                       | 215                                               | 390         | 15                       | 180                                               | 327         | 12                       | 145 | 263 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   | Aciers<br>500 - 850 N/mm²              | G 1/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 9.728                                             | 0.907       | 15                       | 490                                               | 444         | 10                       | 325                                               | 295         | 8                        | 260 | 236 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 1/4                                                                                                                                                                                                                                                                                                                                                                                                                 | 13.157                                            | 1.337       | 15                       | 365                                               | 488         | 10                       | 240                                               | 321         | 8                        | 195 | 261 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 3/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 16.662                                            | 1.337       | 15                       | 285                                               | 381         | 10                       | 190                                               | 254         | 8                        | 155 | 207 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 1/2                                                                                                                                                                                                                                                                                                                                                                                                                 | 20.955                                            | 1.814       | 15                       | 230                                               | 417         | 10                       | 150                                               | 272         | 8                        | 120 | 218 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 5/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 22.911                                            | 1.814       | 15                       | 210                                               | 381         | 10                       | 140                                               | 254         | 8                        | 110 | 200 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 3/4                                                                                                                                                                                                                                                                                                                                                                                                                 | 26.441                                            | 1.814       | 15                       | 180                                               | 327         | 10                       | 120                                               | 218         | 8                        | 95  | 172 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   | Aluminium corroyé<br>Si < 6%<br>trempé | G 1/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 9.728                                             | 0.907       | 15                       | 490                                               | 444         | 12                       | 395                                               | 358         | 10                       | 325 | 295 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 1/4                                                                                                                                                                                                                                                                                                                                                                                                                 | 13.157                                            | 1.337       | 15                       | 365                                               | 488         | 12                       | 290                                               | 388         | 10                       | 240 | 321 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 3/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 16.662                                            | 1.337       | 15                       | 285                                               | 381         | 12                       | 230                                               | 308         | 10                       | 190 | 254 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 1/2                                                                                                                                                                                                                                                                                                                                                                                                                 | 20.955                                            | 1.814       | 15                       | 230                                               | 417         | 12                       | 180                                               | 327         | 10                       | 150 | 272 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 5/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 22.911                                            | 1.814       | 15                       | 210                                               | 381         | 12                       | 165                                               | 299         | 10                       | 140 | 254 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 3/4                                                                                                                                                                                                                                                                                                                                                                                                                 | 26.441                                            | 1.814       | 15                       | 180                                               | 327         | 12                       | 145                                               | 263         | 10                       | 120 | 218 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   | Recommandation:<br>sans revêtement     |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   | Aciers inoxydables<br>[Cr-Ni/1.4301]   | G 1/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 9.728                                             | 0.907       | 5                        | 165                                               | 150         | 4                        | 130                                               | 118         | 3                        | 100 | 91  |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 1/4                                                                                                                                                                                                                                                                                                                                                                                                                 | 13.157                                            | 1.337       | 5                        | 120                                               | 160         | 4                        | 95                                                | 127         | 3                        | 75  | 100 |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 3/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 16.662                                            | 1.337       | 5                        | 95                                                | 127         | 4                        | 75                                                | 100         | 3                        | 55  | 74  |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 1/2                                                                                                                                                                                                                                                                                                                                                                                                                 | 20.955                                            | 1.814       | 5                        | 75                                                | 136         | 4                        | 60                                                | 109         | 3                        | 45  | 82  |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 5/8                                                                                                                                                                                                                                                                                                                                                                                                                 | 22.911                                            | 1.814       | 5                        | 70                                                | 127         | 4                        | 55                                                | 100         | 3                        | 40  | 73  |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        | G 3/4                                                                                                                                                                                                                                                                                                                                                                                                                 | 26.441                                            | 1.814       | 5                        | 60                                                | 109         | 4                        | 50                                                | 91          | 3                        | 35  | 63  |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|  |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|                                                                                   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |     |     |   |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |

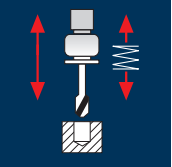


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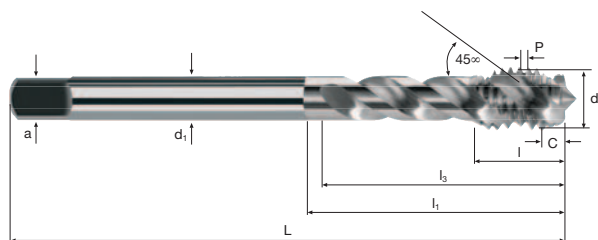
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**G**

[illegible]

| Application                                                                       | Matières                               |       |        |         |                      |        |                |                      |        |                |
|-----------------------------------------------------------------------------------|----------------------------------------|-------|--------|---------|----------------------|--------|----------------|----------------------|--------|----------------|
|   | Aciers<br>< 500 N/mm <sup>2</sup>      | G     | ø      | P       | v <sub>c</sub>       | n      | v <sub>f</sub> | v <sub>c</sub>       | n      | v <sub>f</sub> |
|                                                                                   |                                        | [mm]  | [mm]   | 1.0 x d | [min <sup>-1</sup> ] | [100%] | 1.5 x d        | [min <sup>-1</sup> ] | [100%] | 2.0 x d        |
|                                                                                   |                                        |       |        |         |                      |        |                |                      |        |                |
|                                                                                   |                                        |       |        |         |                      |        |                |                      |        |                |
|                                                                                   |                                        |       |        |         |                      |        |                |                      |        |                |
|                                                                                   |                                        | G 1/8 | 9.728  | 0.907   | 14                   | 460    | 417            | 12                   | 395    | 358            |
|                                                                                   |                                        | G 1/4 | 13.157 | 1.337   | 14                   | 340    | 455            | 12                   | 290    | 388            |
|                                                                                   |                                        | G 3/8 | 16.662 | 1.337   | 14                   | 265    | 354            | 12                   | 230    | 308            |
|                                                                                   |                                        | G 1/2 | 20.955 | 1.814   | 14                   | 215    | 390            | 12                   | 180    | 327            |
|                                                                                   |                                        | G 5/8 | 22.911 | 1.814   | 14                   | 195    | 354            | 12                   | 165    | 299            |
|                                                                                   |                                        | G 3/4 | 26.441 | 1.814   | 14                   | 170    | 308            | 12                   | 145    | 263            |
|                                                                                   | Aciers<br>500 - 850 N/mm <sup>2</sup>  | G 1/8 | 9.728  | 0.907   | 9                    | 295    | 268            | 8                    | 260    | 236            |
|                                                                                   |                                        | G 1/4 | 13.157 | 1.337   | 9                    | 220    | 294            | 8                    | 195    | 261            |
|                                                                                   |                                        | G 3/8 | 16.662 | 1.337   | 9                    | 170    | 227            | 8                    | 155    | 207            |
|                                                                                   |                                        | G 1/2 | 20.955 | 1.814   | 9                    | 135    | 245            | 8                    | 120    | 218            |
|                                                                                   |                                        | G 5/8 | 22.911 | 1.814   | 9                    | 125    | 227            | 8                    | 110    | 200            |
|                                                                                   |                                        | G 3/4 | 26.441 | 1.814   | 9                    | 110    | 200            | 8                    | 95     | 172            |
|                                                                                   | Aluminium corroyé<br>Si < 6%<br>trempé | G 1/8 | 9.728  | 0.907   | 10                   | 325    | 295            | 8                    | 260    | 236            |
|                                                                                   |                                        | G 1/4 | 13.157 | 1.337   | 10                   | 240    | 321            | 8                    | 195    | 261            |
|                                                                                   |                                        | G 3/8 | 16.662 | 1.337   | 10                   | 190    | 254            | 8                    | 155    | 207            |
|                                                                                   |                                        | G 1/2 | 20.955 | 1.814   | 10                   | 150    | 272            | 8                    | 120    | 218            |
|                                                                                   |                                        | G 5/8 | 22.911 | 1.814   | 10                   | 140    | 254            | 8                    | 110    | 200            |
|                                                                                   |                                        | G 3/4 | 26.441 | 1.814   | 10                   | 120    | 218            | 8                    | 95     | 172            |
|                                                                                   | Recommandation:<br>sans revêtement     | G 1/8 | 9.728  | 0.907   | 4                    | 130    | 118            | 3                    | 100    | 91             |
|                                                                                   |                                        | G 1/4 | 13.157 | 1.337   | 4                    | 95     | 127            | 3                    | 75     | 100            |
|                                                                                   |                                        | G 3/8 | 16.662 | 1.337   | 4                    | 75     | 100            | 3                    | 55     | 74             |
|                                                                                   |                                        | G 1/2 | 20.955 | 1.814   | 4                    | 60     | 109            | 3                    | 45     | 82             |
|                                                                                   |                                        | G 5/8 | 22.911 | 1.814   | 4                    | 55     | 100            | 3                    | 40     | 73             |
|                                                                                   |                                        | G 3/4 | 26.441 | 1.814   | 4                    | 50     | 91             | 3                    | 35     | 63             |
|  | Aciers inoxydables<br>[Cr-Ni/1.4301]   | G 1/8 | 9.728  | 0.907   | 4                    | 130    | 118            | 3                    | 100    | 91             |
|                                                                                   |                                        | G 1/4 | 13.157 | 1.337   | 4                    | 95     | 127            | 3                    | 75     | 100            |
|                                                                                   |                                        | G 3/8 | 16.662 | 1.337   | 4                    | 75     | 100            | 3                    | 55     | 74             |
|                                                                                   |                                        | G 1/2 | 20.955 | 1.814   | 4                    | 60     | 109            | 3                    | 45     | 82             |
|                                                                                   |                                        | G 5/8 | 22.911 | 1.814   | 4                    | 55     | 100            | 3                    | 40     | 73             |
|                                                                                   |                                        | G 3/4 | 26.441 | 1.814   | 4                    | 50     | 91             | 3                    | 35     | 63             |





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# Filetage américain UNC / UNJC / UNF / UNJF

## UNC, tolérance 2B

N° EH1687 / EH1688



|  |             |  |                |  |     |
|--|-------------|--|----------------|--|-----|
|  | HSS<br>PM/F |  | Rm<br>850-1100 |  | 305 |
|--|-------------|--|----------------|--|-----|

N° EH1690 / EH1691 x-tap



|  |             |  |                |  |     |
|--|-------------|--|----------------|--|-----|
|  | HSS<br>PM/F |  | Rm<br>850-1100 |  | 309 |
|--|-------------|--|----------------|--|-----|

N° ET1620 / ET1621



|  |             |  |                   |  |     |
|--|-------------|--|-------------------|--|-----|
|  | HSS<br>PM/F |  | Inox<br>Stainless |  | 313 |
|--|-------------|--|-------------------|--|-----|

N° ET1690 / ET1691 x-tap



|  |             |  |                   |  |     |
|--|-------------|--|-------------------|--|-----|
|  | HSS<br>PM/F |  | Inox<br>Stainless |  | 317 |
|--|-------------|--|-------------------|--|-----|

N° EI1602



|  |             |  |                       |              |     |
|--|-------------|--|-----------------------|--------------|-----|
|  | HSS<br>PM/F |  | Al<br>Aluminium Alloy | Cu<br>Copper | 321 |
|--|-------------|--|-----------------------|--------------|-----|

N° EI1652



|  |             |  |                       |              |     |
|--|-------------|--|-----------------------|--------------|-----|
|  | HSS<br>PM/F |  | Al<br>Aluminium Alloy | Cu<br>Copper | 323 |
|--|-------------|--|-----------------------|--------------|-----|

## UNJC, tolérance 3B

N° E1699



|  |             |  |                    |  |     |
|--|-------------|--|--------------------|--|-----|
|  | HSS<br>PM/F |  | Ni<br>Nickel Alloy |  | 325 |
|--|-------------|--|--------------------|--|-----|

UN

## UNF, tolérance 2B

N° EH1787 / EH1788



|  |             |  |                |  |     |
|--|-------------|--|----------------|--|-----|
|  | HSS<br>PM/F |  | Rm<br>850-1100 |  | 327 |
|--|-------------|--|----------------|--|-----|

N° EH1790 / EH1791 x-tap



|  |             |  |                |  |     |
|--|-------------|--|----------------|--|-----|
|  | HSS<br>PM/F |  | Rm<br>850-1100 |  | 329 |
|--|-------------|--|----------------|--|-----|

N° ET1750 / ET1751



|  |             |  |                   |  |     |
|--|-------------|--|-------------------|--|-----|
|  | HSS<br>PM/F |  | Inox<br>Stainless |  | 331 |
|--|-------------|--|-------------------|--|-----|

N° ET1790 / ET1791 x-tap



|  |             |  |                   |  |     |
|--|-------------|--|-------------------|--|-----|
|  | HSS<br>PM/F |  | Inox<br>Stainless |  | 333 |
|--|-------------|--|-------------------|--|-----|

## UNJF, tolérance 3B

N° E1799



|  |             |  |                    |  |     |
|--|-------------|--|--------------------|--|-----|
|  | HSS<br>PM/F |  | Ni<br>Nickel Alloy |  | 335 |
|--|-------------|--|--------------------|--|-----|

A schematic diagram of a mass-spring-damper system. A mass is shown at the top, connected to a fixed base at the bottom by a spring and a damper in parallel. Red arrows indicate the directions of displacement and force.

Aciers  
500 - 850 N/mm<sup>2</sup>

Aciers  
500 - 850 N/mm<sup>2</sup>

Aciers  
500 - 850 N/mm<sup>2</sup>

Aciers  
850 - 1100 N/mm<sup>2</sup>

Aciers  
850 - 1100 N/mm<sup>2</sup>

[illegible]

**Aciers**  
1100 - 1300 N/mm<sup>2</sup>

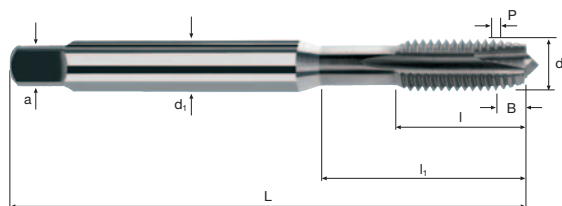
**Aciers**  
1100 - 1300 N/mm<sup>2</sup>

**Aciers**  
1100 - 1300 N/mm<sup>2</sup>

[illegible]

2B



**Rm**  
1100-1300

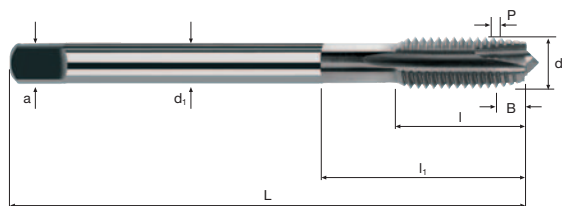
| Response                                                   | Percentage |
|------------------------------------------------------------|------------|
| Yes, the current system is the best way to run the country | 68%        |

N° d'article      Code-ø  
**EH1687**      **.701**

[illegible]

| Application                 | Matières  | <table><tr><th>UNC</th><th>ø<br/>[mm]</th><th>P<br/>[mm]</th><th>Vc<br/>1.5 x d<br/>[min<sup>-1</sup>]</th><th>n<br/>[100%]</th><th>Vf<br/>[100%]</th><th>Vc<br/>2.0 x d<br/>[min<sup>-1</sup>]</th><th>n<br/>[100%]</th><th>Vf<br/>[100%]</th><th>Vc<br/>3.0 x d<br/>[min<sup>-1</sup>]</th><th>n<br/>[100%]</th><th>Vf<br/>[100%]</th></tr><tr><td rowspan="7">Aciers<br/>500 - 850 N/mm²</td><td>7/16</td><td>-14</td><td>11.113</td><td>1.814</td><td>20</td><td>575</td><td>1043</td><td>16</td><td>460</td><td>834</td><td>12</td><td>345</td><td>626</td></tr><tr><td>1/2</td><td>-13</td><td>12.700</td><td>1.954</td><td>20</td><td>500</td><td>977</td><td>16</td><td>400</td><td>782</td><td>12</td><td>300</td><td>586</td></tr><tr><td>9/16</td><td>-12</td><td>14.288</td><td>2.117</td><td>20</td><td>445</td><td>942</td><td>16</td><td>355</td><td>752</td><td>12</td><td>265</td><td>561</td></tr><tr><td>5/8</td><td>-11</td><td>15.875</td><td>2.309</td><td>20</td><td>400</td><td>924</td><td>16</td><td>320</td><td>739</td><td>12</td><td>240</td><td>554</td></tr><tr><td>3/4</td><td>-10</td><td>19.050</td><td>2.540</td><td>20</td><td>335</td><td>851</td><td>16</td><td>265</td><td>673</td><td>12</td><td>200</td><td>508</td></tr><tr><td>7/8</td><td>-9</td><td>22.225</td><td>2.822</td><td>20</td><td>285</td><td>804</td><td>16</td><td>230</td><td>649</td><td>12</td><td>170</td><td>480</td></tr><tr><td>1"</td><td>-8</td><td>25.400</td><td>3.175</td><td>20</td><td>250</td><td>794</td><td>16</td><td>200</td><td>635</td><td>12</td><td>150</td><td>476</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="7">Aciers<br/>850 - 1100 N/mm²</td><td>7/16</td><td>-14</td><td>11.113</td><td>1.814</td><td>16</td><td>460</td><td>834</td><td>12</td><td>345</td><td>626</td><td>10</td><td>285</td><td>517</td></tr><tr><td>1/2</td><td>-13</td><td>12.700</td><td>1.954</td><td>16</td><td>400</td><td>782</td><td>12</td><td>300</td><td>586</td><td>10</td><td>250</td><td>489</td></tr><tr><td>9/16</td><td>-12</td><td>14.288</td><td>2.117</td><td>16</td><td>355</td><td>752</td><td>12</td><td>265</td><td>561</td><td>10</td><td>225</td><td>476</td></tr><tr><td>5/8</td><td>-11</td><td>15.875</td><td>2.309</td><td>16</td><td>320</td><td>739</td><td>12</td><td>240</td><td>554</td><td>10</td><td>200</td><td>462</td></tr><tr><td>3/4</td><td>-10</td><td>19.050</td><td>2.540</td><td>16</td><td>265</td><td>673</td><td>12</td><td>200</td><td>508</td><td>10</td><td>165</td><td>419</td></tr><tr><td>7/8</td><td>-9</td><td>22.225</td><td>2.822</td><td>16</td><td>230</td><td>649</td><td>12</td><td>170</td><td>480</td><td>10</td><td>145</td><td>409</td></tr><tr><td>1"</td><td>-8</td><td>25.400</td><td>3.175</td><td>16</td><td>200</td><td>635</td><td>12</td><td>150</td><td>476</td><td>10</td><td>125</td><td>397</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="7">Aciers<br/>1100 - 1300 N/mm²</td><td>7/16</td><td>-14</td><td>11.113</td><td>1.814</td><td>5</td><td>145</td><td>263</td><td>3</td><td>85</td><td>154</td><td></td><td></td><td></td></tr><tr><td>1/2</td><td>-13</td><td>12.700</td><td>1.954</td><td>5</td><td>125</td><td>244</td><td>3</td><td>75</td><td>147</td><td></td><td></td><td></td></tr><tr><td>9/16</td><td>-12</td><td>14.288</td><td>2.117</td><td>5</td><td>110</td><td>233</td><td>3</td><td>65</td><td>138</td><td></td><td></td><td></td></tr><tr><td>5/8</td><td>-11</td><td>15.875</td><td>2.309</td><td>5</td><td>100</td><td>231</td><td>3</td><td>60</td><td>139</td><td></td><td></td><td></td></tr><tr><td>3/4</td><td>-10</td><td>19.050</td><td>2.540</td><td>5</td><td>85</td><td>216</td><td>3</td><td>50</td><td>127</td><td></td><td></td><td></td></tr><tr><td>7/8</td><td>-9</td><td>22.225</td><td>2.822</td><td>5</td><td>70</td><td>198</td><td>3</td><td>45</td><td>127</td><td></td><td></td><td></td></tr><tr><td>1"</td><td>-8</td><td>25.400</td><td>3.175</td><td>5</td><td>65</td><td>206</td><td>3</td><td>40</td><td>127</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>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|                                       |             |              |                                       |             |              |                                       |             |              |     |     | UNC | ø<br>[mm] | P<br>[mm] | Vc<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | Vf<br>[100%] | Vc<br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | Vf<br>[100%] | Vc<br>3.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | Vf<br>[100%] | Aciers<br>500 - 850 N/mm² | 7/16 | -14 | 11.113 | 1.814 | 20 | 575 | 1043 | 16 | 460 | 834 | 12 | 345 | 626 | 1/2 | -13 | 12.700 | 1.954 | 20 | 500 | 977 | 16 | 400 | 782 | 12 | 300 | 586 | 9/16 | -12 | 14.288 | 2.117 | 20 | 445 | 942 | 16 | 355 | 752 | 12 | 265 | 561 | 5/8 | -11 | 15.875 | 2.309 | 20 | 400 | 924 | 16 | 320 | 739 | 12 | 240 | 554 | 3/4 | -10 | 19.050 | 2.540 | 20 | 335 | 851 | 16 | 265 | 673 | 12 | 200 | 508 | 7/8 | -9 | 22.225 | 2.822 | 20 | 285 | 804 | 16 | 230 | 649 | 12 | 170 | 480 | 1" | -8 | 25.400 | 3.175 | 20 | 250 | 794 | 16 | 200 | 635 | 12 | 150 | 476 |  |  |  |  |  |  |  |  |  |  |  |  |  | Aciers<br>850 - 1100 N/mm² | 7/16 | -14 | 11.113 | 1.814 | 16 | 460 | 834 | 12 | 345 | 626 | 10 | 285 | 517 | 1/2 | -13 | 12.700 | 1.954 | 16 | 400 | 782 | 12 | 300 | 586 | 10 | 250 | 489 | 9/16 | -12 | 14.288 | 2.117 | 16 | 355 | 752 | 12 | 265 | 561 | 10 | 225 | 476 | 5/8 | -11 | 15.875 | 2.309 | 16 | 320 | 739 | 12 | 240 | 554 | 10 | 200 | 462 | 3/4 | -10 | 19.050 | 2.540 | 16 | 265 | 673 | 12 | 200 | 508 | 10 | 165 | 419 | 7/8 | -9 | 22.225 | 2.822 | 16 | 230 | 649 | 12 | 170 | 480 | 10 | 145 | 409 | 1" | -8 | 25.400 | 3.175 | 16 | 200 | 635 | 12 | 150 | 476 | 10 | 125 | 397 |  |  |  |  |  |  |  |  |  |  |  |  |  | Aciers<br>1100 - 1300 N/mm² | 7/16 | -14 | 11.113 | 1.814 | 5 | 145 | 263 | 3 | 85 | 154 |  |  |  | 1/2 | -13 | 12.700 | 1.954 | 5 | 125 | 244 | 3 | 75 | 147 |  |  |  | 9/16 | -12 | 14.288 | 2.117 | 5 | 110 | 233 | 3 | 65 | 138 |  |  |  | 5/8 | -11 | 15.875 | 2.309 | 5 | 100 | 231 | 3 | 60 | 139 |  |  |  | 3/4 | -10 | 19.050 | 2.540 | 5 | 85 | 216 | 3 | 50 | 127 |  |  |  | 7/8 | -9 | 22.225 | 2.822 | 5 | 70 | 198 | 3 | 45 | 127 |  |  |  | 1" | -8 | 25.400 | 3.175 | 5 | 65 | 206 | 3 | 40 | 127 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11.113                                | 1.814       | 20           | 575                                   | 1043        | 16           | 460                                   | 834         | 12           | 345 | 626 |     |           |           |                                       |             |              |                                       |             |              |                                       |             |              |                           |      |     |        |       |    |     |      |    |     |    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|                             | 1/2       | -13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 12.700                                | 1.954       | 20           | 500                                   | 977         | 16           | 400                                   | 782         | 12           | 300 | 586 |     |           |           |                                       |             |              |                                       |             |              |                                       |             |              |                           |      |     |        |       |    |     |      |    |     |    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    |     |    |     |     |    |     |     |    |    |        |       |    |     |     |    |     |     |    |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |                             |      |     |        |       |   |     |     |   |    |     |  |  |  |     |     |        |       |   |     |     |   |    |     |  |  |  |      |     |        |       |   |     |     |   |    |     |  |  |  |     |     |        |       |   |     |     |   |    |     |  |  |  |     |     |        |       |   |    |     |   |    |     |  |  |  |     |    |        |       |   |    |     |   |    |     |  |  |  |    |    |        |       |   |    |     |   |    |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  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|                             | 9/16      | -12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 14.288                                | 2.117       | 20           | 445                                   | 942         | 16           | 355                                   | 752         | 12           | 265 | 561 |     |           |           |                                       |             |              |                                       |             |              |                                       |             |              |                           |      |     |        |       |    |     |      |    |     |     |    |     |     |     |     |        |       |    |     |     |    |     |     |    |     |     |      |     |        |       |    |     |     |    |     |     |    |     |     |     |     |        |       |    |     |     |    |     |     |    |     |     |     |     |        |       |    |     |     |    |     |     |    |     |     |     |    |        |       |    |     |     |    |     |     |    |     |     |    |    |        |       |    |     |     |    |     |     |    |     |     |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |      |     |        |       |    |     |     |    |     |     |    |     |     |     |     |        |       |    |     |     |    |     |     |    |     |     |      |     |        |       |    |     |     |    |     |     |    |     |     |     |     |        |       |    |     |     |    |     |     |    |     |     |     |     |        |       |    |     |     |    |     |     |    |     |     |     |    |        |       |    | 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|                             | 3/4       | -10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          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|             | Aciers<br>500 - 850 N/mm <sup>2</sup>  | 2                                                                                                                                                                                                                                                                                                                                                                                                                       | -56                                               | 2.184       | 0.454                    | 25                                                | 3645        | 1655                     | 22                                                | 3205        | 1455                     | 18 | 2625 | 1192 |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 3                                                                                                                                                                                                                                                                                                                                                                                                                       | -48                                               | 2.515       | 0.529                    | 25                                                | 3165        | 1674                     | 22                                                | 2785        | 1473                     | 18 | 2280 | 1206 |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 4                                                                                                                                                                                                                                                                                                                                                                                                                       | -40                                               | 2.845       | 0.635                    | 25                                                | 2795        | 1775                     | 22                                                | 2460        | 1562                     | 18 | 2015 | 1280 |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 5                                                                                                                                                                                                                                                                                                                                                                                                                       | -40                                               | 3.175       | 0.635                    | 25                                                | 2505        | 1591                     | 22                                                | 2205        | 1400                     | 18 | 1805 | 1146 |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 6                                                                                                                                                                                                                                                                                                                                                                                                                       | -32                                               | 3.505       | 0.794                    | 25                                                | 2270        | 1802                     | 22                                                | 2000        | 1588                     | 18 | 1635 | 1298 |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 8                                                                                                                                                                                                                                                                                                                                                                                                                       | -32                                               | 4.166       | 0.794                    | 25                                                | 1910        | 1517                     | 22                                                | 1680        | 1334                     | 18 | 1375 | 1092 |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 10                                                                                                                                                                                                                                                                                                                                                                                                                      | -24                                               | 4.826       | 1.058                    | 25                                                | 1650        | 1746                     | 22                                                | 1450        | 1534                     | 18 | 1185 | 1254 |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 12                                                                                                                                                                                                                                                                                                                                                                                                                      | -24                                               | 5.486       | 1.058                    | 25                                                | 1450        | 1534                     | 22                                                | 1275        | 1349                     | 18 | 1045 | 1106 |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 1/4                                                                                                                                                                                                                                                                                                                                                                                                                     | -20                                               | 6.350       | 1.270                    | 25                                                | 1255        | 1594                     | 22                                                | 1105        | 1403                     | 18 | 900  | 1143 |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 5/16                                                                                                                                                                                                                                                                                                                                                                                                                    | -18                                               | 7.938       | 1.411                    | 25                                                | 1000        | 1411                     | 22                                                | 880         | 1242                     | 18 | 720  | 1016 |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 3/8                                                                                                                                                                                                                                                                                                                                                                                                                     | -16                                               | 9.525       | 1.588                    | 25                                                | 835         | 1326                     | 22                                                | 735         | 1167                     | 18 | 600  | 953  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
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|             | Aciers<br>500 - 850 N/mm <sup>2</sup>  |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
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|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             | Aciers<br>850 - 1100 N/mm <sup>2</sup> | 2                                                                                                                                                                                                                                                                                                                                                                                                                       | -56                                               | 2.184       | 0.454                    | 16                                                | 2330        | 1058                     | 13                                                | 1895        | 860                      | 8  | 1165 | 529  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 3                                                                                                                                                                                                                                                                                                                                                                                                                       | -48                                               | 2.515       | 0.529                    | 16                                                | 2025        | 1071                     | 13                                                | 1645        | 870                      | 8  | 1015 | 537  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 4                                                                                                                                                                                                                                                                                                                                                                                                                       | -40                                               | 2.845       | 0.635                    | 16                                                | 1790        | 1137                     | 13                                                | 1455        | 924                      | 8  | 895  | 568  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 5                                                                                                                                                                                                                                                                                                                                                                                                                       | -40                                               | 3.175       | 0.635                    | 16                                                | 1605        | 1019                     | 13                                                | 1305        | 829                      | 8  | 800  | 508  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 6                                                                                                                                                                                                                                                                                                                                                                                                                       | -32                                               | 3.505       | 0.794                    | 16                                                | 1455        | 1155                     | 13                                                | 1180        | 937                      | 8  | 725  | 576  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 8                                                                                                                                                                                                                                                                                                                                                                                                                       | -32                                               | 4.166       | 0.794                    | 16                                                | 1225        | 973                      | 13                                                | 995         | 790                      | 8  | 610  | 484  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 10                                                                                                                                                                                                                                                                                                                                                                                                                      | -24                                               | 4.826       | 1.058                    | 16                                                | 1055        | 1116                     | 13                                                | 855         | 905                      | 8  | 530  | 561  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 12                                                                                                                                                                                                                                                                                                                                                                                                                      | -24                                               | 5.486       | 1.058                    | 16                                                | 930         | 984                      | 13                                                | 755         | 799                      | 8  | 465  | 492  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 1/4                                                                                                                                                                                                                                                                                                                                                                                                                     | -20                                               | 6.350       | 1.270                    | 16                                                | 800         | 1016                     | 13                                                | 650         | 826                      | 8  | 400  | 508  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 5/16                                                                                                                                                                                                                                                                                                                                                                                                                    | -18                                               | 7.938       | 1.411                    | 16                                                | 640         | 903                      | 13                                                | 520         | 734                      | 8  | 320  | 452  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        | 3/8                                                                                                                                                                                                                                                                                                                                                                                                                     | -16                                               | 9.525       | 1.588                    | 16                                                | 535         | 850                      | 13                                                | 435         | 691                      | 8  | 265  | 421  |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |    |      |      |           |           |                                                   |             |                          |                                                   |             |                          |                                                   |             |                          |



**UNC**

2B



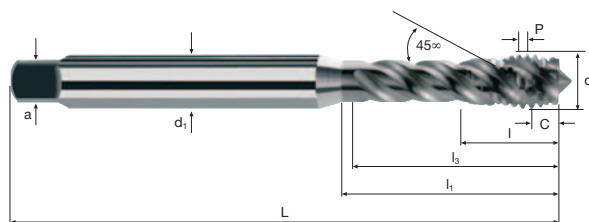
**HSS  
PM/F**



A cross-sectional diagram of a butt joint. Two plates, each 10 mm thick, are joined by a square groove weld. The weld is a square groove weld with a depth of 10 mm. The plates are 10 mm thick. The weld is a square groove weld with a depth of 10 mm. The plates are 10 mm thick.



Form C



**Rm**  
**< 850**

**Rm**  
850-1100

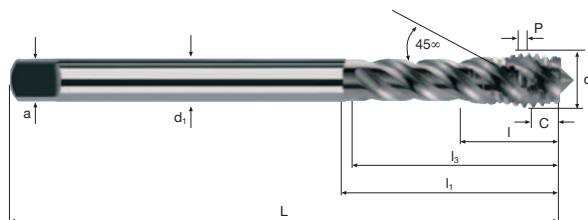
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| Application | Matières                               | <div> <div>UNC</div> <div> <div>ø</div> <div>[mm]</div> </div> <div> <div>P</div> <div>[mm]</div> </div> <div> <div><b>v<sub>c</sub></b></div> <div>1.0 x d</div> </div> <div> <div>n</div> <div>[min<sup>-1</sup>]</div> </div> <div> <div><b>v<sub>f</sub></b></div> <div>[100%]</div> </div> <div> <div><b>v<sub>c</sub></b></div> <div>1.5 x d</div> </div> <div> <div>n</div> <div>[min<sup>-1</sup>]</div> </div> <div> <div><b>v<sub>f</sub></b></div> <div>[100%]</div> </div> <div> <div><b>v<sub>c</sub></b></div> <div>2.0 x d</div> </div> <div> <div>n</div> <div>[min<sup>-1</sup>]</div> </div> <div> <div><b>v<sub>f</sub></b></div> <div>[100%]</div> </div> </div> |
|-------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | Aciers<br>500 - 850 N/mm <sup>2</sup>  | <div>7/16 -14 11.113 1.814 25 715 1297 22 630 1143 18 515 934</div> <div>1/2 -13 12.700 1.954 25 625 1221 22 550 1075 18 450 879</div> <div>9/16 -12 14.288 2.117 25 555 1175 22 490 1037 18 400 847</div> <div>5/8 -11 15.875 2.309 25 500 1155 22 440 1016 18 360 831</div> <div>3/4 -10 19.050 2.540 25 420 1067 22 370 940 18 300 762</div> <div>7/8 -9 22.225 2.822 25 360 1016 22 315 889 18 260 734</div> <div>1" -8 25.400 3.175 25 315 1000 22 275 873 18 225 714</div>                                                                                                                                                                                                     |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             | Aciers<br>850 - 1100 N/mm <sup>2</sup> | <div>7/16 -14 11.113 1.814 16 460 834 13 370 671 8 230 417</div> <div>1/2 -13 12.700 1.954 16 400 782 13 325 635 8 200 391</div> <div>9/16 -12 14.288 2.117 16 355 752 13 290 614 8 180 381</div> <div>5/8 -11 15.875 2.309 16 320 739 13 260 600 8 160 369</div> <div>3/4 -10 19.050 2.540 16 265 673 13 215 546 8 135 343</div> <div>7/8 -9 22.225 2.822 16 230 649 13 185 522 8 115 325</div> <div>1" -8 25.400 3.175 16 200 635 13 165 524 8 100 318</div>                                                                                                                                                                                                                       |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|             |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## 11

2B



**Rm**  
850-1100

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## Aciers inoxydables ferritique/martensitique



## Aciers inoxydables ferritique/martensitique



Aciers inoxydables  
[Cr-Ni/1.4301]



Aciers inoxydables  
[Cr-Ni/1.4301]

[illegible]

Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers réfractaires  
[17-4 PH]

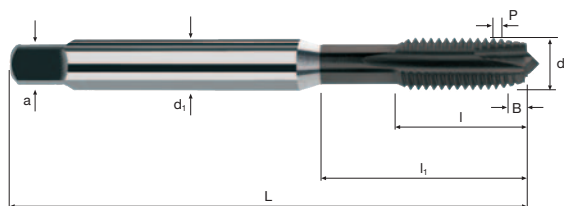


## Aciers réfractaires [17-4 PH]



| UNC  |     | ø     | P     | V <sub>c</sub> | n                    | v <sub>f</sub> | V <sub>c</sub> | n                    | v <sub>f</sub> | V <sub>c</sub> | n                    | v <sub>f</sub> |
|------|-----|-------|-------|----------------|----------------------|----------------|----------------|----------------------|----------------|----------------|----------------------|----------------|
|      |     | [mm]  | [mm]  | 1,5 x d        | [min <sup>-1</sup> ] | [100%]         | 2,0 x d        | [min <sup>-1</sup> ] | [100%]         | 3,0 x d        | [min <sup>-1</sup> ] | [100%]         |
| 2    | -56 | 2.184 | 0.454 | 6              | 875                  | 397            | 5              | 730                  | 331            | 4              | 585                  | 266            |
| 3    | -48 | 2.515 | 0.529 | 6              | 760                  | 402            | 5              | 635                  | 336            | 4              | 505                  | 267            |
| 4    | -40 | 2.845 | 0.635 | 6              | 670                  | 425            | 5              | 560                  | 356            | 4              | 450                  | 286            |
| 5    | -40 | 3.175 | 0.635 | 6              | 600                  | 381            | 5              | 500                  | 318            | 4              | 400                  | 254            |
| 6    | -32 | 3.505 | 0.794 | 6              | 545                  | 433            | 5              | 455                  | 361            | 4              | 365                  | 290            |
| 8    | -32 | 4.166 | 0.794 | 6              | 460                  | 365            | 5              | 380                  | 302            | 4              | 305                  | 242            |
| 10   | -24 | 4.826 | 1.058 | 6              | 395                  | 418            | 5              | 330                  | 349            | 4              | 265                  | 280            |
| 12   | -24 | 5.486 | 1.058 | 6              | 350                  | 370            | 5              | 290                  | 307            | 4              | 230                  | 243            |
| 1/4  | -20 | 6.350 | 1.270 | 6              | 300                  | 381            | 5              | 250                  | 318            | 4              | 200                  | 254            |
| 5/16 | -18 | 7.938 | 1.411 | 6              | 240                  | 339            | 5              | 200                  | 282            | 4              | 160                  | 226            |
| 3/8  | -16 | 9.525 | 1.588 | 6              | 200                  | 318            | 5              | 165                  | 262            | 4              | 135                  | 214            |
|      |     |       |       |                |                      |                |                |                      |                |                |                      |                |
|      |     |       |       |                |                      |                |                |                      |                |                |                      |                |
|      |     |       |       |                |                      |                |                |                      |                |                |                      |                |
|      |     |       |       |                |                      |                |                |                      |                |                |                      |                |
|      |     |       |       |                |                      |                |                |                      |                |                |                      |                |
| 2    | -56 | 2.184 | 0.454 | 4              | 585                  | 266            | 3              | 435                  | 197            | 2              | 290                  | 132            |
| 3    | -48 | 2.515 | 0.529 | 4              | 505                  | 267            | 3              | 380                  | 201            | 2              | 255                  | 135            |
| 4    | -40 | 2.845 | 0.635 | 4              | 450                  | 286            | 3              | 335                  | 213            | 2              | 225                  | 143            |
| 5    | -40 | 3.175 | 0.635 | 4              | 400                  | 254            | 3              | 300                  | 191            | 2              | 200                  | 127            |
| 6    | -32 | 3.505 | 0.794 | 4              | 365                  | 290            | 3              | 270                  | 214            | 2              | 180                  | 143            |
| 8    | -32 | 4.166 | 0.794 | 4              | 305                  | 242            | 3              | 230                  | 183            | 2              | 155                  | 123            |
| 10   | -24 | 4.826 | 1.058 | 4              | 265                  | 280            | 3              | 200                  | 212            | 2              | 130                  | 138            |
| 12   | -24 | 5.486 | 1.058 | 4              | 230                  | 243            | 3              | 175                  | 185            | 2              | 115                  | 122            |
| 1/4  | -20 | 6.350 | 1.270 | 4              | 200                  | 254            | 3              | 150                  | 191            | 2              | 100                  | 127            |
| 5/16 | -18 | 7.938 | 1.411 | 4              | 160                  | 226            | 3              | 120                  | 169            | 2              | 80                   | 113            |
| 3/8  | -16 | 9.525 | 1.588 | 4              | 135                  | 214            | 3              | 100                  | 159            | 2              | 65                   | 103            |
|      |     |       |       |                |                      |                |                |                      |                |                |                      |                |
|      |     |       |       |                |                      |                |                |                      |                |                |                      |                |
|      |     |       |       |                |                      |                |                |                      |                |                |                      |                |
|      |     |       |       |                |                      |                |                |                      |                |                |                      |                |
|      |     |       |       |                |                      |                |                |                      |                |                |                      |                |

2B

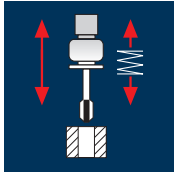


**Inox**  
Stainless

UN

313

## Application



## Matières

Aciers inoxydables  
ferritique/martensitique



Aciers inoxydables  
[Cr-Ni/1.4301]



Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]

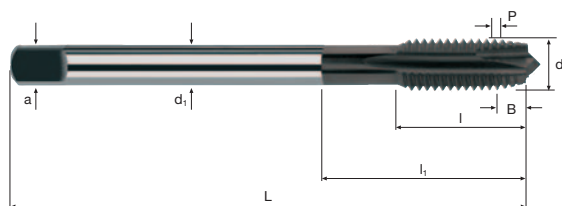


Aciers réfractaires  
[17-4 PH]



| UNC  |     | ø<br>[mm] | P<br>[mm] | <i>v<sub>c</sub></i><br>1.5 x d | n<br>[min <sup>-1</sup> ] | <i>v<sub>f</sub></i><br>[100%] | <i>v<sub>c</sub></i><br>2.0 x d | n<br>[min <sup>-1</sup> ] | <i>v<sub>f</sub></i><br>[100%] | <i>v<sub>c</sub></i><br>3.0 x d | n<br>[min <sup>-1</sup> ] | <i>v<sub>f</sub></i><br>[100%] |
|------|-----|-----------|-----------|---------------------------------|---------------------------|--------------------------------|---------------------------------|---------------------------|--------------------------------|---------------------------------|---------------------------|--------------------------------|
| 7/16 | -14 | 11.113    | 1.814     | 10                              | 285                       | 517                            | 8                               | 230                       | 417                            | 6                               | 170                       | 308                            |
| 1/2  | -13 | 12.700    | 1.954     | 10                              | 250                       | 489                            | 8                               | 200                       | 391                            | 6                               | 150                       | 293                            |
| 9/16 | -12 | 14.288    | 2.117     | 10                              | 225                       | 476                            | 8                               | 180                       | 381                            | 6                               | 135                       | 286                            |
| 5/8  | -11 | 15.875    | 2.309     | 10                              | 200                       | 462                            | 8                               | 160                       | 369                            | 6                               | 120                       | 277                            |
| 3/4  | -10 | 19.050    | 2.540     | 10                              | 165                       | 419                            | 8                               | 135                       | 343                            | 6                               | 100                       | 254                            |
| 7/8  | -9  | 22.225    | 2.822     | 10                              | 145                       | 409                            | 8                               | 115                       | 325                            | 6                               | 85                        | 240                            |
| 1"   | -8  | 25.400    | 3.175     | 10                              | 125                       | 397                            | 8                               | 100                       | 318                            | 6                               | 75                        | 238                            |
|      |     |           |           |                                 |                           |                                |                                 |                           |                                |                                 |                           |                                |
| 7/16 | -14 | 11.113    | 1.814     | 6                               | 170                       | 308                            | 4                               | 115                       | 209                            | 3                               | 85                        | 154                            |
| 1/2  | -13 | 12.700    | 1.954     | 6                               | 150                       | 293                            | 4                               | 100                       | 195                            | 3                               | 75                        | 147                            |
| 9/16 | -12 | 14.288    | 2.117     | 6                               | 135                       | 286                            | 4                               | 90                        | 191                            | 3                               | 65                        | 138                            |
| 5/8  | -11 | 15.875    | 2.309     | 6                               | 120                       | 277                            | 4                               | 80                        | 185                            | 3                               | 60                        | 139                            |
| 3/4  | -10 | 19.050    | 2.540     | 6                               | 100                       | 254                            | 4                               | 65                        | 165                            | 3                               | 50                        | 127                            |
| 7/8  | -9  | 22.225    | 2.822     | 6                               | 85                        | 240                            | 4                               | 55                        | 155                            | 3                               | 45                        | 127                            |
| 1"   | -8  | 25.400    | 3.175     | 6                               | 75                        | 238                            | 4                               | 50                        | 159                            | 3                               | 40                        | 127                            |
|      |     |           |           |                                 |                           |                                |                                 |                           |                                |                                 |                           |                                |
| 7/16 | -14 | 11.113    | 1.814     | 6                               | 170                       | 308                            | 5                               | 145                       | 263                            | 4                               | 115                       | 209                            |
| 1/2  | -13 | 12.700    | 1.954     | 6                               | 150                       | 293                            | 5                               | 125                       | 244                            | 4                               | 100                       | 195                            |
| 9/16 | -12 | 14.288    | 2.117     | 6                               | 135                       | 286                            | 5                               | 110                       | 233                            | 4                               | 90                        | 191                            |
| 5/8  | -11 | 15.875    | 2.309     | 6                               | 120                       | 277                            | 5                               | 100                       | 231                            | 4                               | 80                        | 185                            |
| 3/4  | -10 | 19.050    | 2.540     | 6                               | 100                       | 254                            | 5                               | 85                        | 216                            | 4                               | 65                        | 165                            |
| 7/8  | -9  | 22.225    | 2.822     | 6                               | 85                        | 240                            | 5                               | 70                        | 198                            | 4                               | 55                        | 155                            |
| 1"   | -8  | 25.400    | 3.175     | 6                               | 75                        | 238                            | 5                               | 65                        | 206                            | 4                               | 50                        | 159                            |
|      |     |           |           |                                 |                           |                                |                                 |                           |                                |                                 |                           |                                |
| 7/16 | -14 | 11.113    | 1.814     | 4                               | 115                       | 209                            | 3                               | 85                        | 154                            | 2                               | 55                        | 100                            |
| 1/2  | -13 | 12.700    | 1.954     | 4                               | 100                       | 195                            | 3                               | 75                        | 147                            | 2                               | 50                        | 98                             |
| 9/16 | -12 | 14.288    | 2.117     | 4                               | 90                        | 191                            | 3                               | 65                        | 138                            | 2                               | 45                        | 95                             |
| 5/8  | -11 | 15.875    | 2.309     | 4                               | 80                        | 185                            | 3                               | 60                        | 139                            | 2                               | 40                        | 92                             |
| 3/4  | -10 | 19.050    | 2.540     | 4                               | 65                        | 165                            | 3                               | 50                        | 127                            | 2                               | 35                        | 89                             |
| 7/8  | -9  | 22.225    | 2.822     | 4                               | 55                        | 155                            | 3                               | 45                        | 127                            | 2                               | 30                        | 85                             |
| 1"   | -8  | 25.400    | 3.175     | 4                               | 50                        | 159                            | 3                               | 40                        | 127                            | 2                               | 25                        | 79                             |
|      |     |           |           |                                 |                           |                                |                                 |                           |                                |                                 |                           |                                |

2B



**Inox**  
Stainless

Exemple:  
N° cde

N° d'article

Code-0

ET1621

.712

Ø  
Code

**d**

**P(TPI)**

d  
(mm)

L

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d

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3

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11

[illegible]

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TRIBO  
ET1621

A schematic diagram of a mechanical system. It consists of a mass (represented by a grey rectangle) supported by a spring (represented by a coiled line) and a damper (represented by a piston in a fluid-filled cylinder). The mass is connected to a fixed base (represented by a hatched rectangle) via the spring and damper. Red arrows indicate the displacement of the mass from its equilibrium position.

## Aciers inoxydables ferritique/martensitique



## Aciers inoxydables ferritique/martensitique



Aciers inoxydables  
[Cr-Ni/1.4301]



Aciers inoxydables  
[Cr-Ni/1.4301]

[illegible]

Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



## Aciers réfractaires [17-4 PH]



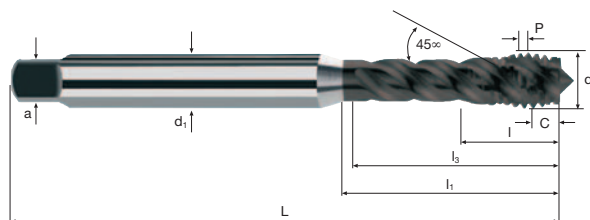
## Aciers réfractaires [17-4 PH]

[illegible]



**In**

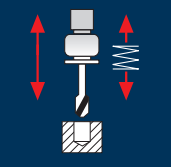
2B



**Inox**  
Stainless

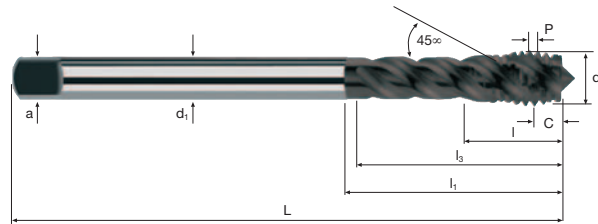
UN

[www.fraisa.com](http://www.fraisa.com)

| Application                                                                      | Matières                                                                                                                                | UNC                   |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |     |     |  |  |  |  |  |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------|------------------------------------------|-------------|-----------------|------------------------------------------|-------------|-----------------|------------------------------------------|-------------|-----------------|-----|-----|--|--|--|--|--|
|                                                                                  |                                                                                                                                         | $\varnothing$<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] |     |     |  |  |  |  |  |
|  | Aciers inoxydables<br>ferritique/martensitique<br><br> | 7/16                  | -14       | 11.113                                   | 1.814       | 8               | 230                                      | 417         | 6               | 170                                      | 308         | 5               | 145 | 263 |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 1/2                   | -13       | 12.700                                   | 1.954       | 8               | 200                                      | 391         | 6               | 150                                      | 293         | 5               | 125 | 244 |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 9/16                  | -12       | 14.288                                   | 2.117       | 8               | 180                                      | 381         | 6               | 135                                      | 286         | 5               | 110 | 233 |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 5/8                   | -11       | 15.875                                   | 2.309       | 8               | 160                                      | 369         | 6               | 120                                      | 277         | 5               | 100 | 231 |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 3/4                   | -10       | 19.050                                   | 2.540       | 8               | 135                                      | 343         | 6               | 100                                      | 254         | 5               | 85  | 216 |  |  |  |  |  |
|                                                                                  | Aciers inoxydables<br>[Cr-Ni/1.4301]<br><br>           | 7/8                   | -9        | 22.225                                   | 2.822       | 8               | 115                                      | 325         | 6               | 85                                       | 240         | 5               | 70  | 198 |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 1"                    | -8        | 25.400                                   | 3.175       | 8               | 100                                      | 318         | 6               | 75                                       | 238         | 5               | 65  | 206 |  |  |  |  |  |
|                                                                                  |                                                                                                                                         |                       |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         |                       |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         |                       |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |     |     |  |  |  |  |  |
|                                                                                  | Aciers inoxydables<br>[Cr-Ni-Mo-.../1.4571]<br><br>    | 7/16                  | -14       | 11.113                                   | 1.814       | 4               | 115                                      | 209         | 3               | 85                                       | 154         | 2               | 55  | 100 |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 1/2                   | -13       | 12.700                                   | 1.954       | 4               | 100                                      | 195         | 3               | 75                                       | 147         | 2               | 50  | 98  |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 9/16                  | -12       | 14.288                                   | 2.117       | 4               | 90                                       | 191         | 3               | 65                                       | 138         | 2               | 45  | 95  |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 5/8                   | -11       | 15.875                                   | 2.309       | 4               | 80                                       | 185         | 3               | 60                                       | 139         | 2               | 40  | 92  |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 3/4                   | -10       | 19.050                                   | 2.540       | 4               | 65                                       | 165         | 3               | 50                                       | 127         | 2               | 35  | 89  |  |  |  |  |  |
|                                                                                  | Aciers réfractaires<br>[17-4 PH]<br><br>               | 7/8                   | -9        | 22.225                                   | 2.822       | 4               | 55                                       | 155         | 3               | 45                                       | 127         | 2               | 30  | 85  |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 1"                    | -8        | 25.400                                   | 3.175       | 4               | 50                                       | 159         | 3               | 40                                       | 127         | 2               | 25  | 79  |  |  |  |  |  |
|                                                                                  |                                                                                                                                         |                       |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         |                       |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         |                       |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |     |     |  |  |  |  |  |
|                                                                                  | Aciers réfractaires<br>[17-4 PH]<br><br>               | 7/16                  | -14       | 11.113                                   | 1.814       | 3               | 85                                       | 154         | 2               | 55                                       | 100         |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 1/2                   | -13       | 12.700                                   | 1.954       | 3               | 75                                       | 147         | 2               | 50                                       | 98          |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 9/16                  | -12       | 14.288                                   | 2.117       | 3               | 65                                       | 138         | 2               | 45                                       | 95          |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 5/8                   | -11       | 15.875                                   | 2.309       | 3               | 60                                       | 139         | 2               | 40                                       | 92          |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 3/4                   | -10       | 19.050                                   | 2.540       | 3               | 50                                       | 127         | 2               | 35                                       | 89          |                 |     |     |  |  |  |  |  |
|                                                                                  | Aciers réfractaires<br>[17-4 PH]<br><br>               | 7/8                   | -9        | 22.225                                   | 2.822       | 3               | 45                                       | 127         | 2               | 30                                       | 85          |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         | 1"                    | -8        | 25.400                                   | 3.175       | 3               | 40                                       | 127         | 2               | 25                                       | 79          |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         |                       |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         |                       |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |     |     |  |  |  |  |  |
|                                                                                  |                                                                                                                                         |                       |           |                                          |             |                 |                                          |             |                 |                                          |             |                 |     |     |  |  |  |  |  |



Form C



UN

319

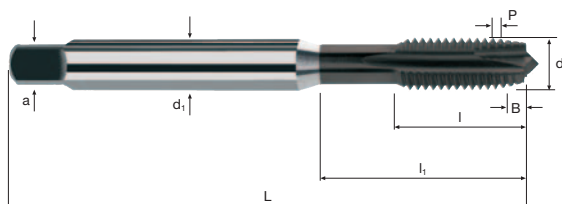
Aluminium non-allié

[illegible]

Aluminium corroyé  
Si < 6%  
trempé

| UNC  |     | $\sigma$ | P     | $V_c$   | n                    | $v_1$  | $V_c$   | n                    | $v_1$  | $V_c$   | n                    | $v_1$  |
|------|-----|----------|-------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|
|      |     | [mm]     | [mm]  | 1.5 x d | [min <sup>-1</sup> ] | [100%] | 2.0 x d | [min <sup>-1</sup> ] | [100%] | 3.0 x d | [min <sup>-1</sup> ] | [100%] |
| 2    | -56 | 2.184    | 0.454 | 16      | 2330                 | 1058   | 14      | 2040                 | 926    | 11      | 1605                 | 729    |
| 3    | -48 | 2.515    | 0.529 | 16      | 2025                 | 1071   | 14      | 1770                 | 936    | 11      | 1390                 | 735    |
| 4    | -40 | 2.845    | 0.635 | 16      | 1790                 | 1137   | 14      | 1565                 | 994    | 11      | 1230                 | 781    |
| 5    | -40 | 3.175    | 0.635 | 16      | 1605                 | 1019   | 14      | 1405                 | 892    | 11      | 1105                 | 704    |
| 6    | -32 | 3.505    | 0.794 | 16      | 1455                 | 1155   | 14      | 1270                 | 1008   | 11      | 1000                 | 794    |
| 8    | -32 | 4.166    | 0.794 | 16      | 1225                 | 973    | 14      | 1070                 | 850    | 11      | 840                  | 667    |
| 10   | -24 | 4.826    | 1.058 | 16      | 1055                 | 1116   | 14      | 925                  | 979    | 11      | 725                  | 767    |
| 12   | -24 | 5.486    | 1.058 | 16      | 930                  | 984    | 14      | 810                  | 857    | 11      | 640                  | 677    |
| 1/4  | -20 | 6.350    | 1.270 | 16      | 800                  | 1016   | 14      | 700                  | 889    | 11      | 550                  | 699    |
| 5/16 | -18 | 7.938    | 1.411 | 16      | 640                  | 903    | 14      | 560                  | 790    | 11      | 440                  | 621    |
| 3/8  | -16 | 9.525    | 1.588 | 16      | 535                  | 850    | 14      | 470                  | 746    | 11      | 370                  | 588    |
|      |     |          |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |          |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |          |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |          |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |          |       |         |                      |        |         |                      |        |         |                      |        |
| 2    | -56 | 2.184    | 0.454 | 17      | 2480                 | 1126   | 14      | 2040                 | 926    | 12      | 1750                 | 795    |
| 3    | -48 | 2.515    | 0.529 | 17      | 2150                 | 1137   | 14      | 1770                 | 936    | 12      | 1520                 | 804    |
| 4    | -40 | 2.845    | 0.635 | 17      | 1900                 | 1207   | 14      | 1565                 | 994    | 12      | 1345                 | 854    |
| 5    | -40 | 3.175    | 0.635 | 17      | 1705                 | 1083   | 14      | 1405                 | 892    | 12      | 1205                 | 765    |
| 6    | -32 | 3.505    | 0.794 | 17      | 1545                 | 1227   | 14      | 1270                 | 1008   | 12      | 1090                 | 865    |
| 8    | -32 | 4.166    | 0.794 | 17      | 1300                 | 1032   | 14      | 1070                 | 850    | 12      | 915                  | 727    |
| 10   | -24 | 4.826    | 1.058 | 17      | 1120                 | 1185   | 14      | 925                  | 979    | 12      | 790                  | 836    |
| 12   | -24 | 5.486    | 1.058 | 17      | 985                  | 1042   | 14      | 810                  | 857    | 12      | 695                  | 735    |
| 1/4  | -20 | 6.350    | 1.270 | 17      | 850                  | 1080   | 14      | 700                  | 889    | 12      | 600                  | 762    |
| 5/16 | -18 | 7.938    | 1.411 | 17      | 680                  | 959    | 14      | 560                  | 790    | 12      | 480                  | 677    |
| 3/8  | -16 | 9.525    | 1.588 | 17      | 570                  | 905    | 14      | 470                  | 746    | 12      | 400                  | 635    |
|      |     |          |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |          |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |          |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |          |       |         |                      |        |         |                      |        |         |                      |        |
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2B



**Plastic**  
Thermoplast

UN

[illegible]

A schematic diagram of a mechanical assembly. It features a central vertical shaft with a piston-like component in the middle. To the left of the shaft is a large red double-headed vertical arrow. To the right of the shaft is a coiled spring with a red double-headed vertical arrow next to it. The entire assembly is shown within a cross-section of a block at the bottom.

Aluminium non-allié

Aluminium non-allié

Aluminium corroyé  
Si < 6%  
non trempé

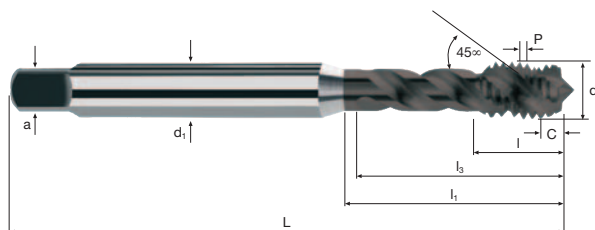
Aluminium corroyé  
Si < 6%  
non trempé

[illegible]

|                                        |  |
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| Aluminium corroyé<br>Si < 6%<br>trempé |  |
| Aluminium corroyé<br>Si < 6%<br>trempé |  |
| Cuivre non-allié                       |  |
| Cuivre non-allié                       |  |

[illegible]

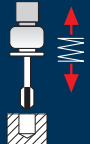
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**Plastic**  
Thermoplast

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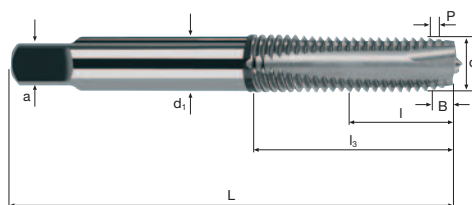
[illegible]

| Application                                                                       | Matières                             | UNJC      |           |                                          |             |                 |                                          |             |                 |     |     |
|-----------------------------------------------------------------------------------|--------------------------------------|-----------|-----------|------------------------------------------|-------------|-----------------|------------------------------------------|-------------|-----------------|-----|-----|
|                                                                                   |                                      | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] |     |     |
|  | Alliages à base nickel<br>non trempé | 4         | -40       | 2.845                                    | 0.635       | 2               | 225                                      | 143         | 1.5             | 170 | 108 |
|                                                                                   |                                      | 6         | -32       | 3.505                                    | 0.794       | 2               | 180                                      | 143         | 1.5             | 135 | 107 |
|                                                                                   |                                      | 8         | -32       | 4.166                                    | 0.794       | 2               | 155                                      | 123         | 1.5             | 115 | 91  |
|                                                                                   |                                      | 10        | -24       | 4.826                                    | 1.058       | 2               | 130                                      | 138         | 1.5             | 100 | 106 |
|                                                                                   |                                      | 1/4       | -20       | 4.350                                    | 1.270       | 2               | 145                                      | 184         | 1.5             | 110 | 140 |
|                                                                                   |                                      | 5/16      | -18       | 7.938                                    | 1.411       | 2               | 80                                       | 113         | 1.5             | 60  | 85  |
|                                                                                   |                                      | 3/8       | -16       | 9.525                                    | 1.588       | 2               | 65                                       | 103         | 1.5             | 50  | 79  |
|                                                                                   |                                      |           |           |                                          |             |                 |                                          |             |                 |     |     |
|  | Alliages à base nickel<br>trempé     | 4         | -40       | 2.845                                    | 0.635       | 1.5             | 170                                      | 108         | 1.5             | 170 | 108 |
|                                                                                   |                                      | 6         | -32       | 3.505                                    | 0.794       | 1.5             | 135                                      | 107         | 1.5             | 135 | 107 |
|                                                                                   |                                      | 8         | -32       | 4.166                                    | 0.794       | 1.5             | 115                                      | 91          | 1.5             | 115 | 91  |
|                                                                                   |                                      | 10        | -24       | 4.826                                    | 1.058       | 1.5             | 100                                      | 106         | 1.5             | 100 | 106 |
|                                                                                   |                                      | 1/4       | -20       | 4.350                                    | 1.270       | 1.5             | 110                                      | 140         | 1.5             | 110 | 140 |
|                                                                                   |                                      | 5/16      | -18       | 7.938                                    | 1.411       | 1.5             | 60                                       | 85          | 1.5             | 60  | 85  |
|                                                                                   |                                      | 3/8       | -16       | 9.525                                    | 1.588       | 1.5             | 50                                       | 79          | 1.5             | 50  | 79  |
|                                                                                   |                                      |           |           |                                          |             |                 |                                          |             |                 |     |     |
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|                                                                                   |                                      |           |           |                                          |             |                 |                                          |             |                 |     |     |

| Application                                                                        | Matières                             | UNJC      |           |                                            |             |                 |                                            |             |                 |     |     |
|------------------------------------------------------------------------------------|--------------------------------------|-----------|-----------|--------------------------------------------|-------------|-----------------|--------------------------------------------|-------------|-----------------|-----|-----|
|                                                                                    |                                      | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[m·min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[m·min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] |     |     |
|  | Alliages à base nickel<br>non trempé | 4         | -40       | 2.845                                      | 0.635       | 2               | 225                                        | 143         | 1.5             | 170 | 108 |
|                                                                                    |                                      | 6         | -32       | 3.505                                      | 0.794       | 2               | 180                                        | 143         | 1.5             | 135 | 107 |
|                                                                                    |                                      | 8         | -32       | 4.166                                      | 0.794       | 2               | 155                                        | 123         | 1.5             | 115 | 91  |
|                                                                                    |                                      | 10        | -24       | 4.826                                      | 1.058       | 2               | 130                                        | 138         | 1.5             | 100 | 106 |
|                                                                                    |                                      | 1/4       | -20       | 4.350                                      | 1.270       | 2               | 145                                        | 184         | 1.5             | 110 | 140 |
|                                                                                    |                                      | 5/16      | -18       | 7.938                                      | 1.411       | 2               | 80                                         | 113         | 1.5             | 60  | 85  |
|                                                                                    |                                      | 3/8       | -16       | 9.525                                      | 1.588       | 2               | 65                                         | 103         | 1.5             | 50  | 79  |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|  | Alliages à base nickel<br>trempé     | 4         | -40       | 2.845                                      | 0.635       | 1.5             | 170                                        | 108         | 1.5             | 170 | 108 |
|                                                                                    |                                      | 6         | -32       | 3.505                                      | 0.794       | 1.5             | 135                                        | 107         | 1.5             | 135 | 107 |
|                                                                                    |                                      | 8         | -32       | 4.166                                      | 0.794       | 1.5             | 115                                        | 91          | 1.5             | 115 | 91  |
|                                                                                    |                                      | 10        | -24       | 4.826                                      | 1.058       | 1.5             | 100                                        | 106         | 1.5             | 100 | 106 |
|                                                                                    |                                      | 1/4       | -20       | 4.350                                      | 1.270       | 1.5             | 110                                        | 140         | 1.5             | 110 | 140 |
|                                                                                    |                                      | 5/16      | -18       | 7.938                                      | 1.411       | 1.5             | 60                                         | 85          | 1.5             | 60  | 85  |
|                                                                                    |                                      | 3/8       | -16       | 9.525                                      | 1.588       | 1.5             | 50                                         | 79          | 1.5             | 50  | 79  |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
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|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |
|                                                                                    |                                      |           |           |                                            |             |                 |                                            |             |                 |     |     |



3B



## Nickel-Alloys

UN

[illegible]

### Application

The diagram illustrates a shock absorber application. It features a central piston rod with a piston head at the bottom and a spring at the top. The piston head is shown in a cross-sectioned view, indicating its internal structure. The spring is represented by a coiled line. Red arrows indicate the direction of movement: a double-headed arrow on the left and a single-headed arrow on the right, both pointing up and down. The entire assembly is mounted on a base, represented by a hatched rectangular block.

**Matières**

**Aciers**  
500 - 850 N/mm<sup>2</sup>

Aciers  
850 - 1100 N/mm<sup>2</sup>

## Matières



| UNF  |     | ø      | P     | Vc      | n                    | Vf     | Vc      | n                    | Vf     | Vc      | n                    | Vf     |
|------|-----|--------|-------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|
|      |     | [mm]   | [mm]  | 1.5 x d | [min <sup>-1</sup> ] | [100%] | 2.0 x d | [min <sup>-1</sup> ] | [100%] | 3.0 x d | [min <sup>-1</sup> ] | [100%] |
| 6    | -40 | 3.505  | 0.635 | 25      | 2270                 | 1441   | 20      | 1815                 | 1153   | 15      | 1360                 | 864    |
| 8    | -36 | 4.166  | 0.706 | 25      | 1910                 | 1348   | 20      | 1530                 | 1080   | 15      | 1145                 | 808    |
| 10   | -32 | 4.826  | 0.794 | 25      | 1650                 | 1310   | 20      | 1320                 | 1048   | 15      | 990                  | 786    |
| 12   | -28 | 5.486  | 0.907 | 25      | 1450                 | 1315   | 20      | 1160                 | 1052   | 15      | 870                  | 789    |
| 1/4  | -28 | 6.350  | 0.907 | 25      | 1255                 | 1138   | 20      | 1005                 | 912    | 15      | 750                  | 680    |
| 5/16 | -24 | 7.938  | 1.058 | 25      | 1005                 | 1064   | 20      | 800                  | 847    | 15      | 600                  | 635    |
| 3/8  | -24 | 9.525  | 1.058 | 25      | 835                  | 883    | 20      | 670                  | 709    | 15      | 500                  | 529    |
| 7/16 | -20 | 11.113 | 1.270 | 25      | 715                  | 908    | 20      | 575                  | 730    | 15      | 430                  | 546    |
| 1/2  | -20 | 12.700 | 1.270 | 25      | 625                  | 794    | 20      | 500                  | 635    | 15      | 375                  | 476    |
| 9/16 | -18 | 14.288 | 1.411 | 25      | 555                  | 783    | 20      | 445                  | 628    | 15      | 335                  | 473    |
| 5/8  | -18 | 15.875 | 1.411 | 25      | 500                  | 706    | 20      | 400                  | 564    | 15      | 300                  | 423    |
| 3/4  | -16 | 19.050 | 1.588 | 25      | 420                  | 667    | 20      | 335                  | 532    | 15      | 250                  | 397    |
| 7/8  | -14 | 22.225 | 1.814 | 25      | 360                  | 653    | 20      | 285                  | 517    | 15      | 215                  | 390    |
| 1"   | -12 | 25.400 | 2.117 | 25      | 315                  | 667    | 20      | 250                  | 529    | 15      | 190                  | 402    |
|      |     |        |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |        |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |        |       |         |                      |        |         |                      |        |         |                      |        |
| 6    | -40 | 3.505  | 0.635 | 20      | 1815                 | 1153   | 15      | 1360                 | 864    | 12      | 1090                 | 692    |
| 8    | -36 | 4.166  | 0.706 | 20      | 1530                 | 1080   | 15      | 1145                 | 808    | 12      | 915                  | 646    |
| 10   | -32 | 4.826  | 0.794 | 20      | 1320                 | 1048   | 15      | 990                  | 786    | 12      | 790                  | 627    |
| 12   | -28 | 5.486  | 0.907 | 20      | 1160                 | 1052   | 15      | 870                  | 789    | 12      | 695                  | 630    |
| 1/4  | -28 | 6.350  | 0.907 | 20      | 1005                 | 912    | 15      | 750                  | 680    | 12      | 600                  | 544    |
| 5/16 | -24 | 7.938  | 1.058 | 20      | 800                  | 847    | 15      | 600                  | 635    | 12      | 480                  | 508    |
| 3/8  | -24 | 9.525  | 1.058 | 20      | 670                  | 709    | 15      | 500                  | 529    | 12      | 400                  | 423    |
| 7/16 | -20 | 11.113 | 1.270 | 20      | 575                  | 730    | 15      | 430                  | 546    | 12      | 345                  | 438    |
| 1/2  | -20 | 12.700 | 1.270 | 20      | 500                  | 635    | 15      | 375                  | 476    | 12      | 300                  | 381    |
| 9/16 | -18 | 14.288 | 1.411 | 20      | 445                  | 628    | 15      | 335                  | 473    | 12      | 265                  | 374    |
| 5/8  | -18 | 15.875 | 1.411 | 20      | 400                  | 564    | 15      | 300                  | 423    | 12      | 240                  | 339    |
| 3/4  | -16 | 19.050 | 1.588 | 20      | 335                  | 532    | 15      | 250                  | 397    | 12      | 200                  | 318    |
| 7/8  | -14 | 22.225 | 1.814 | 20      | 285                  | 517    | 15      | 215                  | 390    | 12      | 170                  | 308    |
| 1"   | -12 | 25.400 | 2.117 | 20      | 250                  | 529    | 15      | 190                  | 402    | 12      | 150                  | 318    |
|      |     |        |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |        |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |        |       |         |                      |        |         |                      |        |         |                      |        |

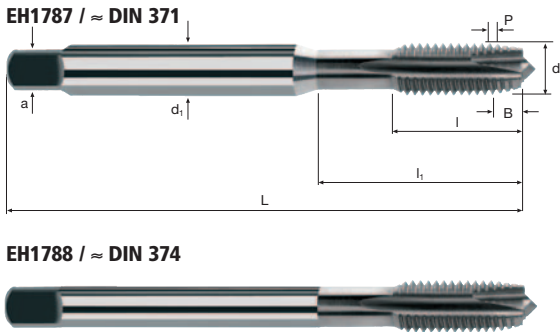
[illegible]

UNF

2B

HSS PM/F

Form B

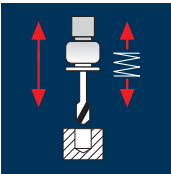


|             |                |                 |  |  |  |  |  |  |  |  |
|-------------|----------------|-----------------|--|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  |  |  |  |  |
|-------------|----------------|-----------------|--|--|--|--|--|--|--|--|

| Exemple: N° cde |        |        |           |     |    |    |      |     |   |      | TiCN   |
|-----------------|--------|--------|-----------|-----|----|----|------|-----|---|------|--------|
| N° d'article    |        |        |           |     |    |    |      |     |   |      | EH1787 |
| Code-ø          |        |        |           |     |    |    |      |     |   |      |        |
| ø<br>Code       | d      | P(TPI) | d<br>(mm) | L   | l  | l1 | d1   | a   |   |      |        |
| .756            | Nr. 6  | -40    | 3.505     | 56  | 12 | 20 | 4.0  | 3.0 | 3 | 2.95 | ●      |
| .757            | Nr. 8  | -36    | 4.166     | 63  | 13 | 21 | 4.5  | 3.4 | 3 | 3.50 | ●      |
| .758            | Nr. 10 | -32    | 4.826     | 70  | 15 | 25 | 6.0  | 4.9 | 3 | 4.10 | ●      |
| .759            | Nr. 12 | -28    | 5.486     | 80  | 17 | 30 | 6.0  | 4.9 | 3 | 4.60 | ●      |
| .760            | 1/4    | -28    | 6.350     | 80  | 17 | 30 | 7.0  | 5.5 | 3 | 5.50 | ●      |
| .761            | 5/16   | -24    | 7.938     | 90  | 20 | 35 | 8.0  | 6.2 | 3 | 6.90 | ●      |
| .762            | 3/8    | -24    | 9.525     | 100 | 22 | 39 | 10.0 | 8.0 | 3 | 8.50 | ●      |
|                 |        |        |           |     |    |    |      |     |   |      |        |
|                 |        |        |           |     |    |    |      |     |   |      |        |

| Exemple: N° cde |      |        |           |     |    |    |      |      |   |       | TiCN   |
|-----------------|------|--------|-----------|-----|----|----|------|------|---|-------|--------|
| N° d'article    |      |        |           |     |    |    |      |      |   |       | EH1788 |
| Code-ø          |      |        |           |     |    |    |      |      |   |       |        |
| ø<br>Code       | d    | P(TPI) | d<br>(mm) | L   | l  | l1 | d1   | a    |   |       |        |
| .763            | 7/16 | -20    | 11.113    | 100 | 22 | 39 | 8.0  | 6.2  | 3 | 9.90  | ●      |
| .764            | 1/2  | -20    | 12.700    | 100 | 22 | 39 | 9.0  | 7.0  | 3 | 11.50 | ●      |
| .765            | 9/16 | -18    | 14.288    | 100 | 22 | 39 | 11.0 | 9.0  | 3 | 12.90 | ●      |
| .766            | 5/8  | -18    | 15.875    | 100 | 22 | 39 | 12.0 | 9.0  | 3 | 14.50 | ●      |
| .767            | 3/4  | -16    | 19.050    | 110 | 25 | 45 | 14.0 | 11.0 | 4 | 17.50 | ●      |
| .768            | 7/8  | -14    | 22.225    | 125 | 26 | 50 | 18.0 | 14.5 | 4 | 20.40 | ●      |
| .769            | 1"   | -12    | 25.400    | 140 | 32 | 52 | 18.0 | 14.5 | 5 | 23.30 | ●      |
|                 |      |        |           |     |    |    |      |      |   |       |        |
|                 |      |        |           |     |    |    |      |      |   |       |        |

## Application



## Matières

Aciers  
850 - 1100 N/mm<sup>2</sup>

[illegible]

UNF

2B



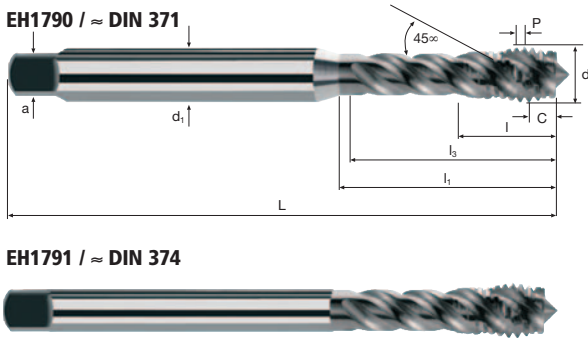
HSS PM/F







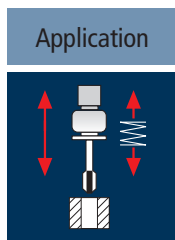
Form C



|             |                |  |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|--|
| Rm<br>< 850 | Rm<br>850-1100 |  |  |  |  |  |  |  |  |  |  |  |
|-------------|----------------|--|--|--|--|--|--|--|--|--|--|--|

| Exemple: N° cde |        |        |           |     |    |    |    |      |     |                                                                                   |                                                                                   | TiCN   |
|-----------------|--------|--------|-----------|-----|----|----|----|------|-----|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|
| N° d'article    |        |        |           |     |    |    |    |      |     |                                                                                   |                                                                                   | EH1790 |
| Code-ø          |        |        |           |     |    |    |    |      |     |                                                                                   |                                                                                   |        |
| ø<br>Code       | d      | P(TPI) | d<br>(mm) | L   | l  | l1 | l3 | d1   | a   |  |  |        |
| .756            | Nr. 6  | -40    | 3.505     | 56  | 6  | 20 | 18 | 4.0  | 3.0 | 3                                                                                 | 2.95                                                                              | ●      |
| .757            | Nr. 8  | -36    | 4.166     | 63  | 7  | 21 | 19 | 4.5  | 3.4 | 3                                                                                 | 3.50                                                                              | ●      |
| .758            | Nr. 10 | -32    | 4.826     | 70  | 8  | 25 | 23 | 6.0  | 4.9 | 3                                                                                 | 4.10                                                                              | ●      |
| .759            | Nr. 12 | -28    | 5.486     | 80  | 10 | 30 | 28 | 6.0  | 4.9 | 3                                                                                 | 4.60                                                                              | ●      |
| .760            | 1/4    | -28    | 6.350     | 80  | 10 | 30 | 28 | 7.0  | 5.5 | 3                                                                                 | 5.50                                                                              | ●      |
| .761            | 5/16   | -24    | 7.938     | 90  | 13 | 35 | 33 | 8.0  | 6.2 | 3                                                                                 | 6.90                                                                              | ●      |
| .762            | 3/8    | -24    | 9.525     | 100 | 15 | 39 | 37 | 10.0 | 8.0 | 3                                                                                 | 8.50                                                                              | ●      |
|                 |        |        |           |     |    |    |    |      |     |                                                                                   |                                                                                   |        |
|                 |        |        |           |     |    |    |    |      |     |                                                                                   |                                                                                   |        |

| Exemple: N° cde |      |        |           |     |    |    |    |      |      |                                                                                     |                                                                                     | TiCN   |
|-----------------|------|--------|-----------|-----|----|----|----|------|------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------|
| N° d'article    |      |        |           |     |    |    |    |      |      |                                                                                     |                                                                                     | EH1791 |
| Code-ø          |      |        |           |     |    |    |    |      |      |                                                                                     |                                                                                     |        |
| ø<br>Code       | d    | P(TPI) | d<br>(mm) | L   | l  | l1 | l3 | d1   | a    |  |  |        |
| .763            | 7/16 | -20    | 11.113    | 100 | 15 | 39 | 37 | 8.0  | 6.2  | 4                                                                                   | 9.90                                                                                | ●      |
| .764            | 1/2  | -20    | 12.700    | 100 | 15 | 39 | 37 | 9.0  | 7.0  | 4                                                                                   | 11.50                                                                               | ●      |
| .765            | 9/16 | -18    | 14.288    | 100 | 15 | 39 | 37 | 11.0 | 9.0  | 4                                                                                   | 12.90                                                                               | ●      |
| .766            | 5/8  | -18    | 15.875    | 100 | 15 | 39 | 37 | 12.0 | 9.0  | 4                                                                                   | 14.50                                                                               | ●      |
| .767            | 3/4  | -16    | 19.050    | 110 | 17 | 50 | 48 | 14.0 | 11.0 | 4                                                                                   | 17.50                                                                               | ●      |
| .768            | 7/8  | -14    | 22.225    | 125 | 18 | 65 | 63 | 18.0 | 14.5 | 5                                                                                   | 20.40                                                                               | ●      |
| .769            | 1"   | -12    | 25.400    | 140 | 24 | 72 | 70 | 18.0 | 14.5 | 5                                                                                   | 23.30                                                                               | ●      |
|                 |      |        |           |     |    |    |    |      |      |                                                                                     |                                                                                     |        |
|                 |      |        |           |     |    |    |    |      |      |                                                                                     |                                                                                     |        |



**Matières**

Aciers inoxydables  
ferritique/martensitique



Aciers inoxydables  
ferritique/martensitique



Aciers inoxydables  
[Cr-Ni/1.4301]



Aciers inoxydables  
[Cr-Ni/1.4301]



| UNF  |     | ø      | P     | $V_c$   | n                    | $v_f$  | $V_c$   | n                    | $v_f$  | $V_c$   | n                    | $v_f$  |
|------|-----|--------|-------|---------|----------------------|--------|---------|----------------------|--------|---------|----------------------|--------|
|      |     | [mm]   | [mm]  | 1.5 x d | [min <sup>-1</sup> ] | [100%] | 2.0 x d | [min <sup>-1</sup> ] | [100%] | 3.0 x d | [min <sup>-1</sup> ] | [100%] |
| 6    | -40 | 3.505  | 0.635 | 12      | 1090                 | 692    | 10      | 910                  | 578    | 8       | 725                  | 460    |
| 8    | -36 | 4.166  | 0.706 | 12      | 915                  | 646    | 10      | 765                  | 540    | 8       | 610                  | 430    |
| 10   | -32 | 4.826  | 0.794 | 12      | 790                  | 627    | 10      | 660                  | 524    | 8       | 530                  | 421    |
| 12   | -28 | 5.486  | 0.907 | 12      | 695                  | 630    | 10      | 580                  | 526    | 8       | 465                  | 422    |
| 1/4  | -28 | 6.350  | 0.907 | 12      | 600                  | 544    | 10      | 500                  | 454    | 8       | 400                  | 363    |
| 5/16 | -24 | 7.938  | 1.058 | 12      | 480                  | 508    | 10      | 400                  | 423    | 8       | 320                  | 339    |
| 3/8  | -24 | 9.525  | 1.058 | 12      | 400                  | 423    | 10      | 335                  | 354    | 8       | 265                  | 280    |
| 7/16 | -20 | 11.113 | 1.270 | 12      | 345                  | 438    | 10      | 285                  | 362    | 8       | 230                  | 292    |
| 1/2  | -20 | 12.700 | 1.270 | 12      | 300                  | 381    | 10      | 250                  | 318    | 8       | 200                  | 254    |
| 9/16 | -18 | 14.288 | 1.411 | 12      | 265                  | 374    | 10      | 225                  | 317    | 8       | 180                  | 254    |
| 5/8  | -18 | 15.875 | 1.411 | 12      | 240                  | 339    | 10      | 200                  | 282    | 8       | 160                  | 226    |
| 3/4  | -16 | 19.050 | 1.588 | 12      | 200                  | 318    | 10      | 165                  | 262    | 8       | 135                  | 214    |
| 7/8  | -14 | 22.225 | 1.814 | 12      | 170                  | 308    | 10      | 145                  | 263    | 8       | 115                  | 209    |
| 1"   | -12 | 25.400 | 2.117 | 12      | 150                  | 318    | 10      | 125                  | 265    | 8       | 100                  | 212    |
|      |     |        |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |        |       |         |                      |        |         |                      |        |         |                      |        |
|      |     |        |       |         |                      |        |         |                      |        |         |                      |        |

|      |     |        |       |   |     |     |   |     |     |   |     |     |
|------|-----|--------|-------|---|-----|-----|---|-----|-----|---|-----|-----|
| 6    | -40 | 3.505  | 0.635 | 7 | 635 | 403 | 5 | 455 | 289 | 4 | 365 | 232 |
| 8    | -36 | 4.166  | 0.706 | 7 | 535 | 377 | 5 | 380 | 268 | 4 | 305 | 215 |
| 10   | -32 | 4.826  | 0.794 | 7 | 460 | 365 | 5 | 330 | 262 | 4 | 265 | 210 |
| 12   | -28 | 5.486  | 0.907 | 7 | 405 | 367 | 5 | 290 | 263 | 4 | 230 | 209 |
| 1/4  | -28 | 6.350  | 0.907 | 7 | 350 | 317 | 5 | 250 | 227 | 4 | 200 | 181 |
| 5/16 | -24 | 7.938  | 1.058 | 7 | 280 | 296 | 5 | 200 | 212 | 4 | 160 | 169 |
| 3/8  | -24 | 9.525  | 1.058 | 7 | 235 | 249 | 5 | 165 | 175 | 4 | 135 | 143 |
| 7/16 | -20 | 11.113 | 1.270 | 7 | 200 | 254 | 5 | 145 | 184 | 4 | 115 | 146 |
| 1/2  | -20 | 12.700 | 1.270 | 7 | 175 | 222 | 5 | 125 | 159 | 4 | 100 | 127 |
| 9/16 | -18 | 14.288 | 1.411 | 7 | 155 | 219 | 5 | 110 | 155 | 4 | 90  | 127 |
| 5/8  | -18 | 15.875 | 1.411 | 7 | 140 | 198 | 5 | 100 | 141 | 4 | 80  | 113 |
| 3/4  | -16 | 19.050 | 1.588 | 7 | 115 | 183 | 5 | 85  | 135 | 4 | 65  | 103 |
| 7/8  | -14 | 22.225 | 1.814 | 7 | 100 | 181 | 5 | 70  | 127 | 4 | 55  | 100 |
| 1"   | -12 | 25.400 | 2.117 | 7 | 90  | 191 | 5 | 65  | 138 | 4 | 50  | 106 |
|      |     |        |       |   |     |     |   |     |     |   |     |     |
|      |     |        |       |   |     |     |   |     |     |   |     |     |
|      |     |        |       |   |     |     |   |     |     |   |     |     |

**Matières**

Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



| UNF  | ø<br>[mm] | P<br>[mm] | $V_c$                           | $n$    | $V_f$                           | $V_c$  | $n$                             | $V_f$  | $V_c$ | $n$ | $V_f$ |     |
|------|-----------|-----------|---------------------------------|--------|---------------------------------|--------|---------------------------------|--------|-------|-----|-------|-----|
|      |           |           | 1.5 x d<br>[min <sup>-1</sup> ] | [100%] | 2.0 x d<br>[min <sup>-1</sup> ] | [100%] | 3.0 x d<br>[min <sup>-1</sup> ] | [100%] |       |     |       |     |
| 6    | -40       | 3.505     | 0.635                           | 8      | 725                             | 460    | 6                               | 545    | 346   | 5   | 455   | 289 |
| 8    | -36       | 4.166     | 0.706                           | 8      | 610                             | 430    | 6                               | 460    | 325   | 5   | 380   | 268 |
| 10   | -32       | 4.826     | 0.794                           | 8      | 530                             | 421    | 6                               | 395    | 314   | 5   | 330   | 262 |
| 12   | -28       | 5.486     | 0.907                           | 8      | 465                             | 422    | 6                               | 350    | 317   | 5   | 290   | 263 |
| 1/4  | -28       | 6.350     | 0.907                           | 8      | 400                             | 363    | 6                               | 300    | 272   | 5   | 250   | 227 |
| 5/16 | -24       | 7.938     | 1.058                           | 8      | 320                             | 339    | 6                               | 240    | 254   | 5   | 200   | 212 |
| 3/8  | -24       | 9.525     | 1.058                           | 8      | 265                             | 280    | 6                               | 200    | 212   | 5   | 165   | 175 |
| 7/16 | -20       | 11.113    | 1.270                           | 8      | 230                             | 292    | 6                               | 170    | 216   | 5   | 145   | 184 |
| 1/2  | -20       | 12.700    | 1.270                           | 8      | 200                             | 254    | 6                               | 150    | 191   | 5   | 125   | 159 |
| 9/16 | -18       | 14.288    | 1.411                           | 8      | 180                             | 254    | 6                               | 135    | 190   | 5   | 110   | 155 |
| 5/8  | -18       | 15.875    | 1.411                           | 8      | 160                             | 226    | 6                               | 120    | 169   | 5   | 100   | 141 |
| 3/4  | -16       | 19.050    | 1.588                           | 8      | 135                             | 214    | 6                               | 100    | 159   | 5   | 85    | 135 |
| 7/8  | -14       | 22.225    | 1.814                           | 8      | 115                             | 209    | 6                               | 85     | 154   | 5   | 70    | 127 |
| 1"   | -12       | 25.400    | 2.117                           | 8      | 100                             | 212    | 6                               | 75     | 159   | 5   | 65    | 138 |
|      |           |           |                                 |        |                                 |        |                                 |        |       |     |       |     |
|      |           |           |                                 |        |                                 |        |                                 |        |       |     |       |     |
|      |           |           |                                 |        |                                 |        |                                 |        |       |     |       |     |

Aciers réfractaires  
[17-4 PH]



|      |     |        |       |   |     |     |   |     |     |   |     |     |
|------|-----|--------|-------|---|-----|-----|---|-----|-----|---|-----|-----|
| 6    | -40 | 3.505  | 0.635 | 5 | 455 | 289 | 4 | 365 | 232 | 3 | 270 | 171 |
| 8    | -36 | 4.166  | 0.706 | 5 | 380 | 268 | 4 | 305 | 215 | 3 | 230 | 162 |
| 10   | -32 | 4.826  | 0.794 | 5 | 330 | 262 | 4 | 265 | 210 | 3 | 200 | 159 |
| 12   | -28 | 5.486  | 0.907 | 5 | 290 | 263 | 4 | 230 | 209 | 3 | 175 | 159 |
| 1/4  | -28 | 6.350  | 0.907 | 5 | 250 | 227 | 4 | 200 | 181 | 3 | 150 | 136 |
| 5/16 | -24 | 7.938  | 1.058 | 5 | 200 | 212 | 4 | 160 | 169 | 3 | 120 | 127 |
| 3/8  | -24 | 9.525  | 1.058 | 5 | 165 | 175 | 4 | 135 | 143 | 3 | 100 | 106 |
| 7/16 | -20 | 11.113 | 1.270 | 5 | 145 | 184 | 4 | 115 | 146 | 3 | 85  | 108 |
| 1/2  | -20 | 12.700 | 1.270 | 5 | 125 | 159 | 4 | 100 | 127 | 3 | 75  | 95  |

Aciers réfractaires  
[17-4 PH]



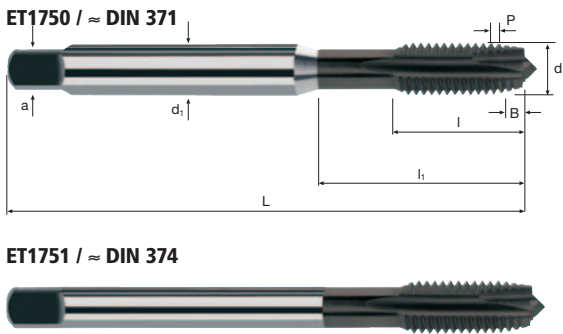
|      |     |        |       |   |     |     |   |    |     |   |    |    |
|------|-----|--------|-------|---|-----|-----|---|----|-----|---|----|----|
| 9/16 | -18 | 14.288 | 1.411 | 5 | 110 | 155 | 4 | 90 | 127 | 3 | 65 | 92 |
| 5/8  | -18 | 15.875 | 1.411 | 5 | 100 | 141 | 4 | 80 | 113 | 3 | 60 | 85 |
| 3/4  | -16 | 19.050 | 1.588 | 5 | 85  | 135 | 4 | 65 | 103 | 3 | 50 | 79 |
| 7/8  | -14 | 22.225 | 1.814 | 5 | 70  | 127 | 4 | 55 | 100 | 3 | 45 | 82 |
| 1"   | -12 | 25.400 | 2.117 | 5 | 65  | 138 | 4 | 50 | 106 | 3 | 40 | 85 |
|      |     |        |       |   |     |     |   |    |     |   |    |    |
|      |     |        |       |   |     |     |   |    |     |   |    |    |
|      |     |        |       |   |     |     |   |    |     |   |    |    |



UNF

2B

HSS PM/F



Inox  
Stainless

UN

|                    |              |        |           |     |    |    |      |     |   |        | TRIBO  |
|--------------------|--------------|--------|-----------|-----|----|----|------|-----|---|--------|--------|
|                    |              |        |           |     |    |    |      |     |   |        | ET1750 |
| Exemple:<br>N° cde | N° d'article |        | Code-ø    |     |    |    |      |     |   |        |        |
| ø<br>Code          | d            | P(TPI) | d<br>(mm) | L   | l  | l1 | d1   | a   |   |        |        |
| .756               | Nr. 6        | -40    | 3.505     | 56  | 12 | 20 | 4.0  | 3.0 | 3 | 3.00   | ●      |
| .757               | Nr. 8        | -36    | 4.166     | 63  | 13 | 21 | 4.5  | 3.4 | 3 | 3.60   | ●      |
| .758               | Nr. 10       | -32    | 4.826     | 70  | 15 | 25 | 6.0  | 4.9 | 3 | 4.20 * | ●      |
| .759               | Nr. 12       | -28    | 5.486     | 80  | 17 | 30 | 6.0  | 4.9 | 3 | 4.70   | ●      |
| .760               | 1/4          | -28    | 6.350     | 80  | 17 | 30 | 7.0  | 5.5 | 3 | 5.60 * | ●      |
| .761               | 5/16         | -24    | 7.938     | 90  | 20 | 35 | 8.0  | 6.2 | 3 | 7.00   | ●      |
| .762               | 3/8          | -24    | 9.525     | 100 | 22 | 39 | 10.0 | 8.0 | 3 | 8.60   | ●      |
|                    |              |        |           |     |    |    |      |     |   |        |        |
|                    |              |        |           |     |    |    |      |     |   |        |        |

|                                      |              |        |           |     |    |    |      |      |   |         | TRIBO  |
|--------------------------------------|--------------|--------|-----------|-----|----|----|------|------|---|---------|--------|
|                                      |              |        |           |     |    |    |      |      |   |         | ET1751 |
| Exemple:<br>N° cde                   | N° d'article |        | Code-ø    |     |    |    |      |      |   |         |        |
| ø<br>Code                            | d            | P(TPI) | d<br>(mm) | L   | l  | l1 | d1   | a    |   |         |        |
| .763                                 | 7/16         | -20    | 11.113    | 100 | 22 | 39 | 8.0  | 6.2  | 3 | 10.00   | ●      |
| .764                                 | 1/2          | -20    | 12.700    | 100 | 22 | 39 | 9.0  | 7.0  | 3 | 11.60   | ●      |
| .765                                 | 9/16         | -18    | 14.288    | 100 | 22 | 39 | 11.0 | 9.0  | 3 | 13.00   | ●      |
| .766                                 | 5/8          | -18    | 15.875    | 100 | 22 | 39 | 12.0 | 9.0  | 3 | 14.70 * | ●      |
| .767                                 | 3/4          | -16    | 19.050    | 110 | 25 | 45 | 14.0 | 11.0 | 4 | 17.70 * | ●      |
| .768                                 | 7/8          | -14    | 22.225    | 125 | 26 | 50 | 18.0 | 14.5 | 4 | 20.70 * | ●      |
| .769                                 | 1"           | -12    | 25.400    | 140 | 32 | 52 | 18.0 | 14.5 | 4 | 23.50   | ●      |
|                                      |              |        |           |     |    |    |      |      |   |         |        |
|                                      |              |        |           |     |    |    |      |      |   |         |        |
| * La dimension donnée est hors norme |              |        |           |     |    |    |      |      |   |         |        |

A schematic diagram of a mechanical system. It consists of a mass (represented by a grey rectangle) supported by a spring (represented by a coiled line) and a damper (represented by a piston in a fluid-filled cylinder). The mass is connected to a fixed base (represented by a hatched rectangle) via the spring and damper. Red arrows indicate the displacement of the mass from its equilibrium position.

## Aciers inoxydables ferritique/martensitique



## Aciers inoxydables ferritique/martensitique



Aciers inoxydables  
[Cr-Ni/1.4301]



Aciers inoxydables  
[Cr-Ni/1.4301]

[illegible]

Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



## Aciers réfractaires [17-4 PH]



## Aciers réfractaires [17-4 PH]



| UNF  |     | ø      | P     | V <sub>c</sub> | n                    | v <sub>f</sub> | V <sub>c</sub> | n                    | v <sub>f</sub> | V <sub>c</sub> | n                    | v <sub>f</sub> |
|------|-----|--------|-------|----------------|----------------------|----------------|----------------|----------------------|----------------|----------------|----------------------|----------------|
|      |     | [mm]   | [mm]  | 1.0 x d        | [min <sup>-1</sup> ] | [100%]         | 1.5 x d        | [min <sup>-1</sup> ] | [100%]         | 2.0 x d        | [min <sup>-1</sup> ] | [100%]         |
| 6    | -40 | 3.505  | 0.635 | 6              | 545                  | 346            | 5              | 455                  | 289            | 4              | 365                  | 232            |
| 8    | -36 | 4.166  | 0.706 | 6              | 460                  | 325            | 5              | 380                  | 268            | 4              | 305                  | 215            |
| 10   | -32 | 4.826  | 0.794 | 6              | 395                  | 314            | 5              | 330                  | 262            | 4              | 265                  | 210            |
| 12   | -28 | 5.486  | 0.907 | 6              | 350                  | 317            | 5              | 290                  | 263            | 4              | 230                  | 209            |
| 1/4  | -28 | 6.350  | 0.907 | 6              | 300                  | 272            | 5              | 250                  | 227            | 4              | 200                  | 181            |
| 5/16 | -24 | 7.938  | 1.058 | 6              | 240                  | 254            | 5              | 200                  | 212            | 4              | 160                  | 169            |
| 3/8  | -24 | 9.525  | 1.058 | 6              | 200                  | 212            | 5              | 165                  | 175            | 4              | 135                  | 143            |
| 7/16 | -20 | 11.113 | 1.270 | 6              | 170                  | 216            | 5              | 145                  | 184            | 4              | 115                  | 146            |
| 1/2  | -20 | 12.700 | 1.270 | 6              | 150                  | 191            | 5              | 125                  | 159            | 4              | 100                  | 127            |
| 9/16 | -18 | 14.288 | 1.411 | 6              | 135                  | 190            | 5              | 110                  | 155            | 4              | 90                   | 127            |
| 5/8  | -18 | 15.875 | 1.411 | 6              | 120                  | 169            | 5              | 100                  | 141            | 4              | 80                   | 113            |
| 3/4  | -16 | 19.050 | 1.588 | 6              | 100                  | 159            | 5              | 85                   | 135            | 4              | 65                   | 103            |
| 7/8  | -14 | 22.225 | 1.814 | 6              | 85                   | 154            | 5              | 70                   | 127            | 4              | 55                   | 100            |
| 1"   | -12 | 25.400 | 2.117 | 6              | 75                   | 159            | 5              | 65                   | 138            | 4              | 50                   | 106            |
|      |     |        |       |                |                      |                |                |                      |                |                |                      |                |
|      |     |        |       |                |                      |                |                |                      |                |                |                      |                |
| 6    | -40 | 3.505  | 0.635 | 4              | 365                  | 232            | 3              | 270                  | 171            |                |                      |                |
| 8    | -36 | 4.166  | 0.706 | 4              | 305                  | 215            | 3              | 230                  | 162            |                |                      |                |
| 10   | -32 | 4.826  | 0.794 | 4              | 265                  | 210            | 3              | 200                  | 159            |                |                      |                |
| 12   | -28 | 5.486  | 0.907 | 4              | 230                  | 209            | 3              | 175                  | 159            |                |                      |                |
| 1/4  | -28 | 6.350  | 0.907 | 4              | 200                  | 181            | 3              | 150                  | 136            |                |                      |                |
| 5/16 | -24 | 7.938  | 1.058 | 4              | 160                  | 169            | 3              | 120                  | 127            |                |                      |                |
| 3/8  | -24 | 9.525  | 1.058 | 4              | 135                  | 143            | 3              | 100                  | 106            |                |                      |                |
| 7/16 | -20 | 11.113 | 1.270 | 4              | 115                  | 146            | 3              | 85                   | 108            |                |                      |                |
| 1/2  | -20 | 12.700 | 1.270 | 4              | 100                  | 127            | 3              | 75                   | 95             |                |                      |                |
| 9/16 | -18 | 14.288 | 1.411 | 4              | 90                   | 127            | 3              | 65                   | 92             |                |                      |                |
| 5/8  | -18 | 15.875 | 1.411 | 4              | 80                   | 113            | 3              | 60                   | 85             |                |                      |                |
| 3/4  | -16 | 19.050 | 1.588 | 4              | 65                   | 103            | 3              | 50                   | 79             |                |                      |                |
| 7/8  | -14 | 22.225 | 1.814 | 4              | 55                   | 100            | 3              | 45                   | 82             |                |                      |                |
| 1"   | -12 | 25.400 | 2.117 | 4              | 50                   | 106            | 3              | 40                   | 85             |                |                      |                |
|      |     |        |       |                |                      |                |                |                      |                |                |                      |                |
|      |     |        |       |                |                      |                |                |                      |                |                |                      |                |
|      |     |        |       |                |                      |                |                |                      |                |                |                      |                |



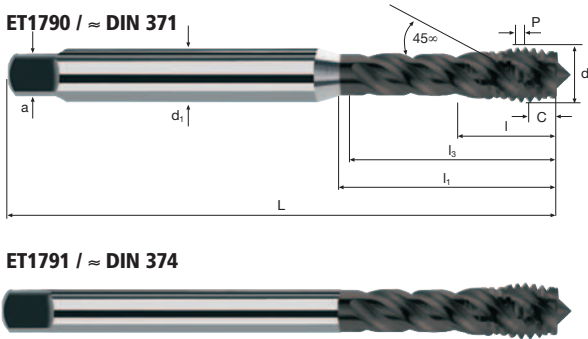


UNF

2B

HSS PM/F

X - P  
Form C



Inox  
Stainless

UN

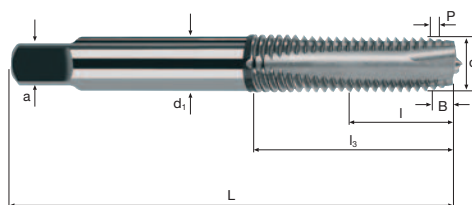
|                    |              |        |           |     |    |    |    |      |     |   |        | TRIBO  |
|--------------------|--------------|--------|-----------|-----|----|----|----|------|-----|---|--------|--------|
|                    |              |        |           |     |    |    |    |      |     |   |        | ET1790 |
| Exemple:<br>N° cde | N° d'article |        | Code-ø    |     |    |    |    |      |     |   |        |        |
|                    | ET1790       |        | .756      |     |    |    |    |      |     |   |        |        |
| ø<br>Code          | d            | P(TPI) | d<br>(mm) | L   | l  | l1 | l3 | d1   | a   |   |        |        |
| .756               | Nr. 6        | -40    | 3.505     | 56  | 6  | 20 | 18 | 4.0  | 3.0 | 3 | 3.00   | ●      |
| .757               | Nr. 8        | -36    | 4.166     | 63  | 7  | 21 | 19 | 4.5  | 3.4 | 3 | 3.60   | ●      |
| .758               | Nr. 10       | -32    | 4.826     | 70  | 8  | 25 | 23 | 6.0  | 4.9 | 3 | 4.20 * | ●      |
| .759               | Nr. 12       | -28    | 5.486     | 80  | 10 | 30 | 28 | 6.0  | 4.9 | 3 | 4.70   | ●      |
| .760               | 1/4          | -28    | 6.350     | 80  | 10 | 30 | 28 | 7.0  | 5.5 | 3 | 5.60 * | ●      |
| .761               | 5/16         | -24    | 7.938     | 90  | 13 | 35 | 33 | 8.0  | 6.2 | 3 | 7.00   | ●      |
| .762               | 3/8          | -24    | 9.525     | 100 | 15 | 39 | 37 | 10.0 | 8.0 | 3 | 8.60   | ●      |
|                    |              |        |           |     |    |    |    |      |     |   |        |        |
|                    |              |        |           |     |    |    |    |      |     |   |        |        |

|                                      |              |        |           |     |    |    |    |      |      |   |         | TRIBO  |
|--------------------------------------|--------------|--------|-----------|-----|----|----|----|------|------|---|---------|--------|
|                                      |              |        |           |     |    |    |    |      |      |   |         | ET1791 |
| Exemple:<br>N° cde                   | N° d'article |        | Code-ø    |     |    |    |    |      |      |   |         |        |
|                                      | ET1791       |        | .763      |     |    |    |    |      |      |   |         |        |
| ø<br>Code                            | d            | P(TPI) | d<br>(mm) | L   | l  | l1 | l3 | d1   | a    |   |         |        |
| .763                                 | 7/16         | -20    | 11.113    | 100 | 15 | 39 | 37 | 8.0  | 6.2  | 4 | 10.00   | ●      |
| .764                                 | 1/2          | -20    | 12.700    | 100 | 15 | 39 | 37 | 9.0  | 7.0  | 4 | 11.60   | ●      |
| .765                                 | 9/16         | -18    | 14.288    | 100 | 15 | 39 | 37 | 11.0 | 9.0  | 4 | 13.00   | ●      |
| .766                                 | 5/8          | -18    | 15.875    | 100 | 15 | 39 | 37 | 12.0 | 9.0  | 4 | 14.70 * | ●      |
| .767                                 | 3/4          | -16    | 19.050    | 110 | 17 | 50 | 48 | 14.0 | 11.0 | 4 | 17.70 * | ●      |
| .768                                 | 7/8          | -14    | 22.225    | 125 | 18 | 65 | 63 | 18.0 | 14.5 | 5 | 20.70 * | ●      |
| .769                                 | 1"           | -12    | 25.400    | 140 | 24 | 72 | 70 | 18.0 | 14.5 | 5 | 23.50   | ●      |
|                                      |              |        |           |     |    |    |    |      |      |   |         |        |
|                                      |              |        |           |     |    |    |    |      |      |   |         |        |
| * La dimension donnée est hors norme |              |        |           |     |    |    |    |      |      |   |         |        |

| Application                                                                       | Matières                             |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------------------------------------------------------|--------------------------------------|--|--|--|--|--|--|--|--|--|--|
|  | Alliages à base nickel<br>non trempé |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|  | Alliages à base nickel<br>trempé     |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |
|                                                                                   |                                      |  |  |  |  |  |  |  |  |  |  |

| Application                                                                        | Matières                                                                                                                        |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------|-----------|-----------|--------------------------------------------|-------------|-----------------|--------------------------------------------|-------------|-----------------|-----|--|
|  | Alliages à base nickel<br>non trempé<br><br> | UNJF | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.0 x d<br>[m·min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] | $v_c$<br>1.5 x d<br>[m·min <sup>-1</sup> ] | n<br>[100%] | $v_f$<br>[100%] |     |  |
|                                                                                    |                                                                                                                                 | 6    | -40       | 3.505     | 0.635                                      | 3           | 270             | 171                                        | 2           | 180             | 114 |  |
|                                                                                    |                                                                                                                                 | 8    | -36       | 4.166     | 0.706                                      | 3           | 230             | 162                                        | 2           | 155             | 109 |  |
|                                                                                    |                                                                                                                                 | 10   | -32       | 4.826     | 0.794                                      | 3           | 200             | 159                                        | 2           | 130             | 103 |  |
|                                                                                    |                                                                                                                                 | 1/4  | -28       | 6.350     | 0.907                                      | 3           | 150             | 136                                        | 2           | 100             | 91  |  |
|                                                                                    |                                                                                                                                 | 5/16 | -24       | 7.938     | 1.058                                      | 3           | 120             | 127                                        | 2           | 80              | 85  |  |
|                                                                                    |                                                                                                                                 | 3/8  | -24       | 9.525     | 1.058                                      | 3           | 100             | 106                                        | 2           | 65              | 69  |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    | Alliages à base nickel<br>trempé<br><br>     | 6    | -40       | 3.505     | 0.635                                      | 2           | 180             | 114                                        | 2           | 180             | 114 |  |
|                                                                                    |                                                                                                                                 | 8    | -36       | 4.166     | 0.706                                      | 2           | 155             | 109                                        | 2           | 155             | 109 |  |
|                                                                                    |                                                                                                                                 | 10   | -32       | 4.826     | 0.794                                      | 2           | 130             | 103                                        | 2           | 130             | 103 |  |
|                                                                                    |                                                                                                                                 | 1/4  | -28       | 6.350     | 0.907                                      | 2           | 100             | 91                                         | 2           | 100             | 91  |  |
|                                                                                    |                                                                                                                                 | 5/16 | -24       | 7.938     | 1.058                                      | 2           | 80              | 85                                         | 2           | 80              | 85  |  |
|                                                                                    |                                                                                                                                 | 3/8  | -24       | 9.525     | 1.058                                      | 2           | 65              | 69                                         | 2           | 65              | 69  |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |
|                                                                                    |                                                                                                                                 |      |           |           |                                            |             |                 |                                            |             |                 |     |  |

3B



## Nickel-Alloys

UN

[illegible]



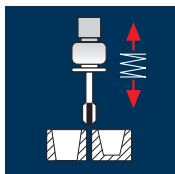
Filetage américain pas de gaz conique NPT / NPTF

| NPT       |                                                                                  |                                                                                   |              |                                                                                   |                   |
|-----------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------|-----------------------------------------------------------------------------------|-------------------|
| N° ET1830 |  |  | HSS-E<br>Co5 |  | Inox<br>Stainless |
| N° E11820 |  |  | HSS-E<br>Co5 |  | Rm<br><850        |

| NPTF      |                                                                                  |                                                                                   |              |                                                                                   |            |
|-----------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------|-----------------------------------------------------------------------------------|------------|
| N° E11846 |  |  | HSS-E<br>Co5 |  | Rm<br><850 |

NPT  
NPTF

## Application



## Matières

Aciers inoxydables  
ferritique/martensitique



Aciers inoxydables  
[Cr-Ni/1.4301]



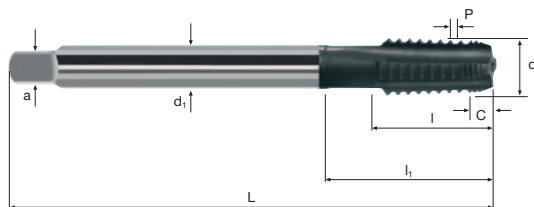
Aciers inoxydables  
[Cr-Ni-Mo-.../1.4571]



Aciers réfractaires  
[17-4 PH]



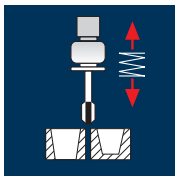
| NPT  | ø<br>[mm] | P<br>[mm] | $V_c$ | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |    |  |
|------|-----------|-----------|-------|---------------------------|-----------------|----|--|
| 1/16 | -27       | 6.25      | 0.941 | 2                         | 100             | 94 |  |
| 1/8  | -27       | 8.50      | 0.941 | 2                         | 75              | 71 |  |
| 1/4  | -18       | 11.10     | 1.411 | 2                         | 55              | 78 |  |
| 3/8  | -18       | 14.70     | 1.411 | 2                         | 45              | 63 |  |
| 1/2  | -14       | 18.00     | 1.814 | 2                         | 35              | 63 |  |
| 3/4  | -14       | 23.25     | 1.814 | 2                         | 25              | 45 |  |
| 1"   | -11.5     | 29.25     | 2.209 | 2                         | 20              | 44 |  |
|      |           |           |       |                           |                 |    |  |
|      |           |           |       |                           |                 |    |  |
| 1/16 | -27       | 6.25      | 0.941 | 2                         | 100             | 94 |  |
| 1/8  | -27       | 8.50      | 0.941 | 2                         | 75              | 71 |  |
| 1/4  | -18       | 11.10     | 1.411 | 2                         | 55              | 78 |  |
| 3/8  | -18       | 14.70     | 1.411 | 2                         | 45              | 63 |  |
| 1/2  | -14       | 18.00     | 1.814 | 2                         | 35              | 63 |  |
| 3/4  | -14       | 23.25     | 1.814 | 2                         | 25              | 45 |  |
| 1"   | -11.5     | 29.25     | 2.209 | 2                         | 20              | 44 |  |
|      |           |           |       |                           |                 |    |  |
|      |           |           |       |                           |                 |    |  |
| 1/16 | -27       | 6.25      | 0.941 | 1.5                       | 75              | 71 |  |
| 1/8  | -27       | 8.50      | 0.941 | 1.5                       | 55              | 52 |  |
| 1/4  | -18       | 11.10     | 1.411 | 1.5                       | 45              | 63 |  |
| 3/8  | -18       | 14.70     | 1.411 | 1.5                       | 30              | 42 |  |
| 1/2  | -14       | 18.00     | 1.814 | 1.5                       | 25              | 45 |  |
| 3/4  | -14       | 23.25     | 1.814 | 1.5                       | 20              | 36 |  |
| 1"   | -11.5     | 29.25     | 2.209 | 1.5                       | 15              | 33 |  |
|      |           |           |       |                           |                 |    |  |
|      |           |           |       |                           |                 |    |  |



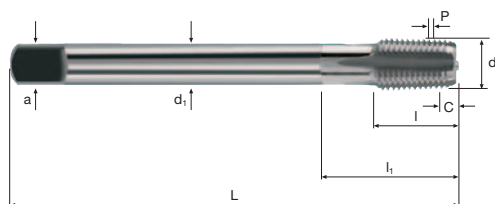
**Inox**  
Stainless

[illegible]

**NPT**  
**NPTF**

| Application                                                                                                                 | Matières                                                                                                               | NPT      | ø<br>[mm] | P<br>[mm] | V <sub>c</sub> | n<br>[min <sup>-1</sup> ] | V <sub>f</sub><br>[100%] |  |  |
|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|----------------|---------------------------|--------------------------|--|--|
|                                             | Aciers<br>< 500 N/mm <sup>2</sup><br> | 1/16 -27 | 6.25      | 0.941     | 8              | 405                       | 381                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/8 -27  | 8.50      | 0.941     | 8              | 300                       | 282                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/4 -18  | 11.10     | 1.411     | 8              | 230                       | 325                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/8 -18  | 14.70     | 1.411     | 8              | 175                       | 247                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/2 -14  | 18.00     | 1.814     | 8              | 140                       | 254                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/4 -14  | 23.25     | 1.814     | 8              | 110                       | 200                      |  |  |
|                                                                                                                             |                                                                                                                        | 1" -11.5 | 29.25     | 2.209     | 8              | 85                        | 188                      |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
| Aciers<br>500 - 850 N/mm <sup>2</sup><br>  |                                                                                                                        | 1/16 -27 | 6.25      | 0.941     | 6              | 305                       | 287                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/8 -27  | 8.50      | 0.941     | 6              | 225                       | 212                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/4 -18  | 11.10     | 1.411     | 6              | 170                       | 240                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/8 -18  | 14.70     | 1.411     | 6              | 130                       | 183                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/2 -14  | 18.00     | 1.814     | 6              | 105                       | 190                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/4 -14  | 23.25     | 1.814     | 6              | 80                        | 145                      |  |  |
|                                                                                                                             |                                                                                                                        | 1" -11.5 | 29.25     | 2.209     | 6              | 65                        | 144                      |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
| Aciers<br>850 - 1100 N/mm <sup>2</sup><br> |                                                                                                                        | 1/16 -27 | 6.25      | 0.941     | 5              | 255                       | 240                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/8 -27  | 8.50      | 0.941     | 5              | 185                       | 174                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/4 -18  | 11.10     | 1.411     | 5              | 145                       | 205                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/8 -18  | 14.70     | 1.411     | 5              | 110                       | 155                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/2 -14  | 18.00     | 1.814     | 5              | 90                        | 163                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/4 -14  | 23.25     | 1.814     | 5              | 70                        | 127                      |  |  |
|                                                                                                                             |                                                                                                                        | 1" -11.5 | 29.25     | 2.209     | 5              | 55                        | 121                      |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
| Aluminium corroyé<br>Si < 6% trempé<br>    |                                                                                                                        | 1/16 -27 | 6.25      | 0.941     | 10             | 510                       | 480                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/8 -27  | 8.50      | 0.941     | 10             | 375                       | 353                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/4 -18  | 11.10     | 1.411     | 10             | 285                       | 402                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/8 -18  | 14.70     | 1.411     | 10             | 215                       | 303                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/2 -14  | 18.00     | 1.814     | 10             | 175                       | 317                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/4 -14  | 23.25     | 1.814     | 10             | 135                       | 245                      |  |  |
|                                                                                                                             |                                                                                                                        | 1" -11.5 | 29.25     | 2.209     | 10             | 110                       | 243                      |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
| Fonte<br>GG(G)<br>                       |                                                                                                                        | 1/16 -27 | 6.25      | 0.941     | 6              | 305                       | 287                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/8 -27  | 8.50      | 0.941     | 6              | 225                       | 212                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/4 -18  | 11.10     | 1.411     | 6              | 170                       | 240                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/8 -18  | 14.70     | 1.411     | 6              | 130                       | 183                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/2 -14  | 18.00     | 1.814     | 6              | 105                       | 190                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/4 -14  | 23.25     | 1.814     | 6              | 80                        | 145                      |  |  |
|                                                                                                                             |                                                                                                                        | 1" -11.5 | 29.25     | 2.209     | 6              | 65                        | 144                      |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |



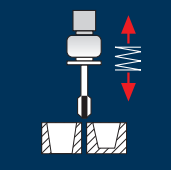


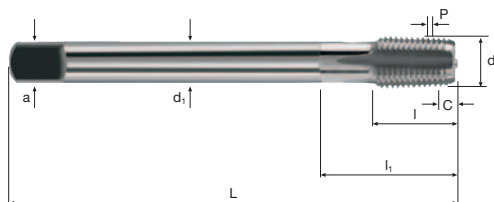
**Rm**  
850-1100

**Rm**  
850-1100

**GG(G)**  
**Aluminium**  
**Copper**

**NPT**  
**NPTF**

| Application                                                                                                                 | Matières                                                                                                               | NPTF     | ø<br>[mm] | P<br>[mm] | V <sub>c</sub> | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] |  |  |
|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|----------------|---------------------------|--------------------------|--|--|
|                                             | Aciers<br>< 500 N/mm <sup>2</sup><br> | 1/16 -27 | 6.25      | 0.941     | 8              | 405                       | 381                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/8 -27  | 8.50      | 0.941     | 8              | 300                       | 282                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/4 -18  | 11.10     | 1.411     | 8              | 230                       | 325                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/8 -18  | 14.70     | 1.411     | 8              | 175                       | 247                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/2 -14  | 18.00     | 1.814     | 8              | 140                       | 254                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/4 -14  | 23.25     | 1.814     | 8              | 110                       | 200                      |  |  |
|                                                                                                                             |                                                                                                                        | 1" -11.5 | 29.25     | 2.209     | 8              | 85                        | 188                      |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
| Aciers<br>500 - 850 N/mm <sup>2</sup><br>  |                                                                                                                        | 1/16 -27 | 6.25      | 0.941     | 6              | 305                       | 287                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/8 -27  | 8.50      | 0.941     | 6              | 225                       | 212                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/4 -18  | 11.10     | 1.411     | 6              | 170                       | 240                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/8 -18  | 14.70     | 1.411     | 6              | 130                       | 183                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/2 -14  | 18.00     | 1.814     | 6              | 105                       | 190                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/4 -14  | 23.25     | 1.814     | 6              | 80                        | 145                      |  |  |
|                                                                                                                             |                                                                                                                        | 1" -11.5 | 29.25     | 2.209     | 6              | 65                        | 144                      |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
| Aciers<br>850 - 1100 N/mm <sup>2</sup><br> |                                                                                                                        | 1/16 -27 | 6.25      | 0.941     | 5              | 255                       | 240                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/8 -27  | 8.50      | 0.941     | 5              | 185                       | 174                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/4 -18  | 11.10     | 1.411     | 5              | 145                       | 205                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/8 -18  | 14.70     | 1.411     | 5              | 110                       | 155                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/2 -14  | 18.00     | 1.814     | 5              | 90                        | 163                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/4 -14  | 23.25     | 1.814     | 5              | 70                        | 127                      |  |  |
|                                                                                                                             |                                                                                                                        | 1" -11.5 | 29.25     | 2.209     | 5              | 55                        | 121                      |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
| Aluminium corroyé<br>Si < 6% trempé<br>    |                                                                                                                        | 1/16 -27 | 6.25      | 0.941     | 10             | 510                       | 480                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/8 -27  | 8.50      | 0.941     | 10             | 375                       | 353                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/4 -18  | 11.10     | 1.411     | 10             | 285                       | 402                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/8 -18  | 14.70     | 1.411     | 10             | 215                       | 303                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/2 -14  | 18.00     | 1.814     | 10             | 175                       | 317                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/4 -14  | 23.25     | 1.814     | 10             | 135                       | 245                      |  |  |
|                                                                                                                             |                                                                                                                        | 1" -11.5 | 29.25     | 2.209     | 10             | 110                       | 243                      |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
| Matières                                                                                                                    | Fonte<br>GG(G)<br>                  | 1/16 -27 | 6.25      | 0.941     | 6              | 305                       | 287                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/8 -27  | 8.50      | 0.941     | 6              | 225                       | 212                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/4 -18  | 11.10     | 1.411     | 6              | 170                       | 240                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/8 -18  | 14.70     | 1.411     | 6              | 130                       | 183                      |  |  |
|                                                                                                                             |                                                                                                                        | 1/2 -14  | 18.00     | 1.814     | 6              | 105                       | 190                      |  |  |
|                                                                                                                             |                                                                                                                        | 3/4 -14  | 23.25     | 1.814     | 6              | 80                        | 145                      |  |  |
|                                                                                                                             |                                                                                                                        | 1" -11.5 | 29.25     | 2.209     | 6              | 65                        | 144                      |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |
|                                                                                                                             |                                                                                                                        |          |           |           |                |                           |                          |  |  |



**Rm**  
850-1100

**GG(G)**  
**Aluminium**  
**Copper**

**NPT**  
**NPTF**



Filetage métrique pour filets rapportés EG M

Tolérance 6H mod

N° E11970 / E11971

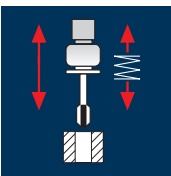


|                                                                                   |                      |                                                                                   |                   |                                 |     |
|-----------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------|-------------------|---------------------------------|-----|
|  | <b>HSS-E<br/>Co5</b> |  | <b>Rm</b><br><850 | <b>Al</b><br>Aluminium<br>Alloy | 347 |
|  | <b>HSS-E<br/>Co5</b> |  | <b>Rm</b><br><850 | <b>Al</b><br>Aluminium<br>Alloy | 349 |

N° E11980 / E11981



## Application



## Matières

**Aciers**  
**< 500 N/mm<sup>2</sup>**

Aciers  
< 500 N/mm<sup>2</sup>

Aciers  
500 - 850 N/mm<sup>2</sup>

Aciers  
500 - 850 N/mm<sup>2</sup>

[illegible]

## Matières

Aluminium corroyé  
Si < 6%  
trempé

Aluminium corroyé  
Si < 6%  
trempé

**Cuivre non-allié**

**Cuivre non-allié**

[illegible]

# Tarauds pour filets rapportés

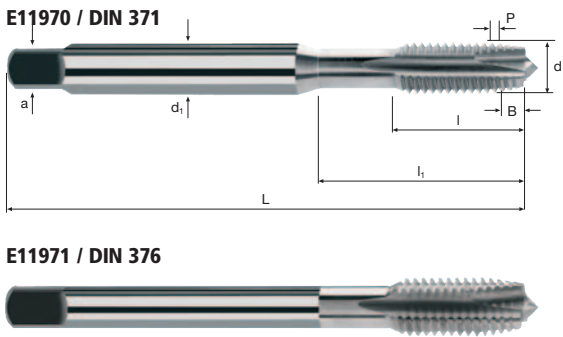


EG M

6H mod

HSS-E Co5

Form B



Rm < 850

Al Aluminium > 99%

Al Aluminium Alloy

Al Aluminium Cast

Cu Copper

Plastic Thermoplast

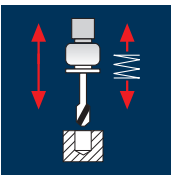
GG(G)

| Exemple: N° cde <b>E11970</b> N° d'article <b>.034</b> Code-ø <b>.034</b> |         |      |     |    |    |      |     |   |      | <b>E11970</b> |  |
|---------------------------------------------------------------------------|---------|------|-----|----|----|------|-----|---|------|---------------|--|
| Ø Code                                                                    | d       | P    | L   | l  | l1 | d1   | a   |   |      |               |  |
| .034                                                                      | EGM 2   | 0.40 | 50  | 9  | 15 | 2.8  | 2.1 | 2 | 2.15 | ●             |  |
| .040                                                                      | EGM 2.5 | 0.45 | 56  | 12 | 18 | 3.5  | 2.7 | 3 | 2.65 | ●             |  |
| .044                                                                      | EGM 3   | 0.50 | 63  | 13 | 21 | 4.5  | 3.0 | 3 | 3.15 | ●             |  |
| .058                                                                      | EGM 4   | 0.70 | 70  | 15 | 25 | 6.0  | 4.9 | 3 | 4.20 | ●             |  |
| .084                                                                      | EGM 5   | 0.80 | 80  | 17 | 30 | 6.0  | 4.9 | 3 | 5.25 | ●             |  |
| .088                                                                      | EGM 6   | 1.00 | 90  | 20 | 35 | 8.0  | 6.2 | 3 | 6.30 | ●             |  |
| .160                                                                      | EGM 8   | 1.25 | 100 | 22 | 39 | 10.0 | 8.0 | 3 | 8.40 | ●             |  |
|                                                                           |         |      |     |    |    |      |     |   |      |               |  |
|                                                                           |         |      |     |    |    |      |     |   |      |               |  |

EG

| Exemple: N° cde <b>E11971</b> N° d'article <b>.174</b> Code-ø <b>.174</b> |       |      |     |    |    |      |      |   |       | <b>E11971</b> |  |
|---------------------------------------------------------------------------|-------|------|-----|----|----|------|------|---|-------|---------------|--|
| Ø Code                                                                    | d     | P    | L   | l  | l1 | d1   | a    |   |       |               |  |
| .174                                                                      | EGM10 | 1.50 | 110 | 24 | 40 | 9.0  | 7.0  | 3 | 10.40 | ●             |  |
| .240                                                                      | EGM12 | 1.75 | 110 | 26 | 40 | 11.0 | 9.0  | 3 | 12.50 | ●             |  |
| .244                                                                      | EGM14 | 2.00 | 110 | 27 | 40 | 12.0 | 9.0  | 4 | 14.50 | ●             |  |
| .246                                                                      | EGM16 | 2.00 | 125 | 30 | 65 | 14.0 | 11.0 | 4 | 16.50 | ●             |  |
|                                                                           |       |      |     |    |    |      |      |   |       |               |  |
|                                                                           |       |      |     |    |    |      |      |   |       |               |  |
|                                                                           |       |      |     |    |    |      |      |   |       |               |  |
|                                                                           |       |      |     |    |    |      |      |   |       |               |  |

## Application



## Matières

Aciers  
< 500 N/mm<sup>2</sup>

**Aciers**  
**< 500 N/mm<sup>2</sup>**

**Aciers**  
500 - 850 N/mm<sup>2</sup>

**Aciers**  
500 - 850 N/mm<sup>2</sup>

[illegible]

## Matières

Aluminium corroyé  
Si < 6%  
trempé

**Aluminium corroyé**  
**Si < 6%**  
**trempe**

**Cuivre non-allié**

**Cuivre non-allié**

[illegible]



# Tarauds pour filets rapportés

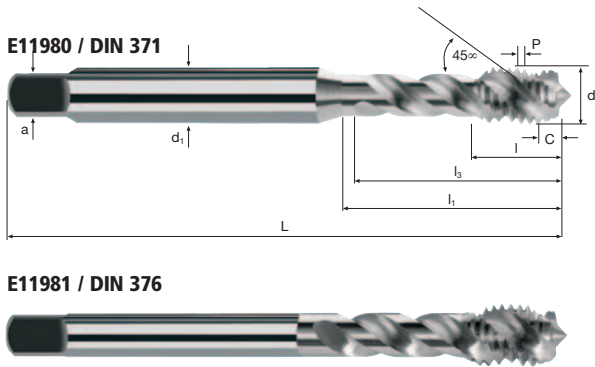


EG M

6H mod

HSS-E Co5

X - P  
Form C



Rm  
< 850

Al  
Aluminium  
> 99%

Al  
Aluminium  
Alloy

Al  
Aluminium  
Cast

Cu  
Copper

Plastic  
Thermoplast

GG(G)

| Exemple:<br>N° cde |         |              |     |        |    |    |      |     |   |      | E11980 |  |
|--------------------|---------|--------------|-----|--------|----|----|------|-----|---|------|--------|--|
|                    |         | N° d'article |     | Code-ø |    |    |      |     |   |      |        |  |
|                    |         | E11980       |     | .034   |    |    |      |     |   |      |        |  |
| Ø<br>Code          | d       | P            | L   | l      | l1 | l3 | d1   | a   |   |      |        |  |
| .034               | EGM 2   | 0.40         | 50  | 9.0    | 15 | 13 | 2.8  | 2.1 | 3 | 2.15 | ●      |  |
| .040               | EGM 2.5 | 0.45         | 56  | 4.0    | 18 | 16 | 3.5  | 2.7 | 3 | 2.65 | ●      |  |
| .044               | EGM 3   | 0.50         | 63  | 5.6    | 21 | 19 | 4.5  | 3.0 | 3 | 3.15 | ●      |  |
| .058               | EGM 4   | 0.70         | 70  | 6.4    | 25 | 23 | 6.0  | 4.9 | 3 | 4.20 | ●      |  |
| .084               | EGM 5   | 0.80         | 80  | 8.0    | 30 | 28 | 6.0  | 4.9 | 3 | 5.25 | ●      |  |
| .088               | EGM 6   | 1.00         | 90  | 10.0   | 35 | 33 | 8.0  | 6.2 | 3 | 6.30 | ●      |  |
| .160               | EGM 8   | 1.25         | 100 | 12.0   | 39 | 37 | 10.0 | 8.0 | 3 | 8.40 | ●      |  |
|                    |         |              |     |        |    |    |      |     |   |      |        |  |
|                    |         |              |     |        |    |    |      |     |   |      |        |  |

EG

| Exemple:<br>N° cde |       |              |     |        |    |    |      |      |   |       | E11981 |  |
|--------------------|-------|--------------|-----|--------|----|----|------|------|---|-------|--------|--|
|                    |       | N° d'article |     | Code-ø |    |    |      |      |   |       |        |  |
|                    |       | E11981       |     | .174   |    |    |      |      |   |       |        |  |
| Ø<br>Code          | d     | P            | L   | l      | l1 | l3 | d1   | a    |   |       |        |  |
| .174               | EGM10 | 1.50         | 110 | 14.0   | 50 | 48 | 9.0  | 7.0  | 3 | 10.40 | ●      |  |
| .240               | EGM12 | 1.75         | 110 | 16.0   | 58 | 56 | 11.0 | 9.0  | 4 | 12.50 | ●      |  |
| .244               | EGM14 | 2.00         | 110 | 16.0   | 58 | 56 | 12.0 | 9.0  | 4 | 14.50 | ●      |  |
| .246               | EGM16 | 2.00         | 125 | 20.0   | 65 | 63 | 14.0 | 11.0 | 4 | 16.50 | ●      |  |
|                    |       |              |     |        |    |    |      |      |   |       |        |  |
|                    |       |              |     |        |    |    |      |      |   |       |        |  |
|                    |       |              |     |        |    |    |      |      |   |       |        |  |
|                    |       |              |     |        |    |    |      |      |   |       |        |  |



# Tarands à refouler M

## Tolérance ISO 2 (6H)

N° EF10060 / EF10061



N° EH6100 / EH6101

duroform



N° EL10080 / EL10081



N° EH10070 / EH10071



N° EH10072 / EH10073



new!

|    |             |  |                          |                          |     |
|----|-------------|--|--------------------------|--------------------------|-----|
| Al | HSS<br>PM/F |  | Al<br>Aluminium<br>Alloy | Cu<br>Copper             | 355 |
| U  | HM<br>MG10  |  | Rm<br><850-1100          | Al<br>Aluminium<br>Alloy | 359 |
| St | HSS<br>PM/F |  | Rm<br><850               |                          | 361 |
| St | HSS<br>PM/F |  | Rm<br><850               |                          | 365 |
| St | HSS<br>PM/F |  | Rm<br><850               |                          | 369 |

## Tolérance ISO 3 (6G)

N° EF10064 / EF10065



N° EH10074 / EH10075



|    |             |  |                          |              |     |
|----|-------------|--|--------------------------|--------------|-----|
| Al | HSS<br>PM/F |  | Al<br>Aluminium<br>Alloy | Cu<br>Copper | 371 |
| St | HSS<br>PM/F |  | Rm<br><850               |              | 373 |

## Tolérance 7G

N° EF10068



N° EH10078



|    |             |  |                          |              |     |
|----|-------------|--|--------------------------|--------------|-----|
| Al | HSS<br>PM/F |  | Al<br>Aluminium<br>Alloy | Cu<br>Copper | 375 |
| St | HSS<br>PM/F |  | Rm<br><850               |              | 377 |

CF



Tarauds à refouler MF

| Tolérance ISO 2 (6H) |                                                                                   |             |                                                                                   |                          |              |
|----------------------|-----------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------|--------------------------|--------------|
| N° EF11260 / EF11261 |  | HSS<br>PM/F |  | Al<br>Aluminium<br>Alloy | Cu<br>Copper |
| N° EH11270 / EH11271 |  | HSS<br>PM/F |  | Rm<br><850               |              |
|                      |                                                                                   |             |                                                                                   |                          | 379          |
|                      |                                                                                   |             |                                                                                   |                          | 381          |

Tarauds à refouler pour filets rapportés EG M

| Tolérance 6H mod     |                                                                                   |             |                                                                                   |                          |              |
|----------------------|-----------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------|--------------------------|--------------|
| N° EF11960 / EF11961 |  | HSS<br>PM/F |  | Al<br>Aluminium<br>Alloy | Cu<br>Copper |
| N° EH11950 / EH11951 |  | HSS<br>PM/F |  | Rm<br><850               |              |
|                      |                                                                                   |             |                                                                                   |                          | 383          |
|                      |                                                                                   |             |                                                                                   |                          | 385          |

CF

A schematic diagram of a mechanical system. A mass is supported by a spring and a damper in parallel. Red arrows indicate vertical displacement.

## Aluminium non-allié

[illegible]

**Cuivre non-allié**



| M     | ø<br>[mm] | P<br>[mm] | V <sub>C</sub> |                           |                          | V <sub>F</sub> |                           |                          | V <sub>C</sub> |                           |                          | V <sub>F</sub> |  |  |
|-------|-----------|-----------|----------------|---------------------------|--------------------------|----------------|---------------------------|--------------------------|----------------|---------------------------|--------------------------|----------------|--|--|
|       |           |           | 1.5 x d        | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] | 2.0 x d        | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] | 3.0 x d        | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] |                |  |  |
| M 1   | 1.0       | 0.25      | 15             | 4775                      | 1194                     | 10             | 3185                      | 796                      | 10             | 3185                      | 796                      |                |  |  |
| M 1.2 | 1.2       | 0.25      | 15             | 3980                      | 995                      | 10             | 2655                      | 664                      | 10             | 2655                      | 664                      |                |  |  |
| M 1.4 | 1.4       | 0.30      | 15             | 3410                      | 1023                     | 10             | 2275                      | 683                      | 10             | 2275                      | 683                      |                |  |  |
| M 1.6 | 1.6       | 0.35      | 15             | 2985                      | 1045                     | 10             | 1990                      | 697                      | 10             | 1990                      | 697                      |                |  |  |
| M 1.8 | 1.8       | 0.35      | 15             | 2655                      | 929                      | 10             | 1770                      | 620                      | 10             | 1770                      | 620                      |                |  |  |
| M 2   | 2.0       | 0.40      | 15             | 2385                      | 954                      | 10             | 1590                      | 636                      | 10             | 1590                      | 636                      |                |  |  |
| M 2.2 | 2.2       | 0.45      | 15             | 2170                      | 977                      | 10             | 1445                      | 650                      | 10             | 1445                      | 650                      |                |  |  |
| M 2.5 | 2.5       | 0.45      | 15             | 1910                      | 860                      | 10             | 1275                      | 574                      | 10             | 1275                      | 574                      |                |  |  |
| M 3   | 3.0       | 0.50      | 15             | 1590                      | 795                      | 10             | 1060                      | 530                      | 10             | 1060                      | 530                      |                |  |  |

**Cuivre non-allié**

[illegible]

Métaux non ferreux  
A<sub>5</sub> > 15%

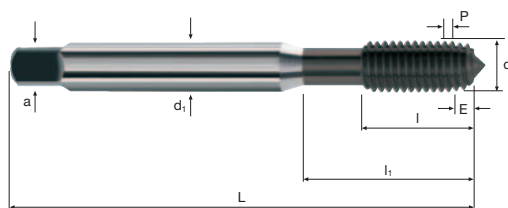
|       |     |      |    |      |      |    |      |     |    |      |     |
|-------|-----|------|----|------|------|----|------|-----|----|------|-----|
| M 1   | 1.0 | 0.25 | 15 | 4775 | 1194 | 10 | 3185 | 796 | 10 | 3185 | 796 |
| M 1.2 | 1.2 | 0.25 | 15 | 3980 | 995  | 10 | 2655 | 664 | 10 | 2655 | 664 |
| M 1.4 | 1.4 | 0.30 | 15 | 3410 | 1023 | 10 | 2275 | 683 | 10 | 2275 | 683 |
| M 1.6 | 1.6 | 0.35 | 15 | 2985 | 1045 | 10 | 1990 | 697 | 10 | 1990 | 697 |
| M 1.8 | 1.8 | 0.35 | 15 | 2655 | 929  | 10 | 1770 | 620 | 10 | 1770 | 620 |
| M 2   | 2.0 | 0.40 | 15 | 2385 | 954  | 10 | 1590 | 636 | 10 | 1590 | 636 |
| M 2.2 | 2.2 | 0.45 | 15 | 2170 | 977  | 10 | 1445 | 650 | 10 | 1445 | 650 |
| M 2.5 | 2.5 | 0.45 | 15 | 1910 | 860  | 10 | 1275 | 574 | 10 | 1275 | 574 |
| M 3   | 3.0 | 0.50 | 15 | 1590 | 795  | 10 | 1060 | 530 | 10 | 1060 | 530 |

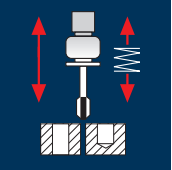
Métaux non ferreux  
 $A_5 > 15\%$

[illegible]

AI

**ISO 2  
(6H)**

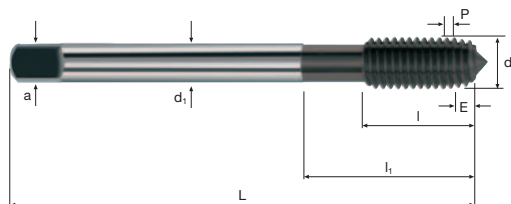
[illegible]

| Application                                                                      | Matières                                                                                                                        | M   | ø    | P    | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----|------|------|----------------|----------------------|--------|----------------|----------------------|--------|----------------|----------------------|--------|
|                                                                                  |                                                                                                                                 |     | [mm] | [mm] | $1.5 \times d$ | [min <sup>-1</sup> ] | [100%] | $2.0 \times d$ | [min <sup>-1</sup> ] | [100%] | $3.0 \times d$ | [min <sup>-1</sup> ] | [100%] |
|  | Aluminium non-allié                                                                                                             | M12 | 12.0 | 1.75 | 25             | 665                  | 1164   | 20             | 530                  | 928    | 15             | 400                  | 700    |
|                                                                                  |                                                                                                                                 | M14 | 14.0 | 2.00 | 25             | 570                  | 1140   | 20             | 455                  | 910    | 15             | 340                  | 680    |
|                                                                                  |                                                                                                                                 | M16 | 16.0 | 2.00 | 25             | 495                  | 990    | 20             | 400                  | 800    | 15             | 300                  | 600    |
|                                                                                  |                                                                                                                                 |     |      |      |                |                      |        |                |                      |        |                |                      |        |
|                                                                                  | Aluminium corroyé<br>Si < 6%<br>non trempé                                                                                      | M12 | 12.0 | 1.75 | 30             | 795                  | 1391   | 25             | 665                  | 1164   | 20             | 530                  | 928    |
|                                                                                  |                                                                                                                                 | M14 | 14.0 | 2.00 | 30             | 680                  | 1360   | 25             | 570                  | 1140   | 20             | 455                  | 910    |
|                                                                                  |                                                                                                                                 | M16 | 16.0 | 2.00 | 30             | 595                  | 1190   | 25             | 495                  | 990    | 20             | 400                  | 800    |
|                                                                                  |                                                                                                                                 |     |      |      |                |                      |        |                |                      |        |                |                      |        |
|                                                                                  | Cuivre non-allié<br>                           | M12 | 12.0 | 1.75 | 15             | 400                  | 700    | 10             | 265                  | 464    | 10             | 265                  | 464    |
|                                                                                  |                                                                                                                                 | M14 | 14.0 | 2.00 | 15             | 340                  | 680    | 10             | 225                  | 450    | 10             | 225                  | 450    |
|                                                                                  |                                                                                                                                 | M16 | 16.0 | 2.00 | 15             | 300                  | 600    | 10             | 200                  | 400    | 10             | 200                  | 400    |
|                                                                                  |                                                                                                                                 |     |      |      |                |                      |        |                |                      |        |                |                      |        |
|                                                                                  | Métaux non ferreux<br>A <sub>s</sub> > 15%<br> | M12 | 12.0 | 1.75 | 15             | 400                  | 700    | 10             | 265                  | 464    | 10             | 265                  | 464    |
|                                                                                  |                                                                                                                                 | M14 | 14.0 | 2.00 | 15             | 340                  | 680    | 10             | 225                  | 450    | 10             | 225                  | 450    |
|                                                                                  |                                                                                                                                 | M16 | 16.0 | 2.00 | 15             | 300                  | 600    | 10             | 200                  | 400    | 10             | 200                  | 400    |
|                                                                                  |                                                                                                                                 |     |      |      |                |                      |        |                |                      |        |                |                      |        |



AI

**ISO 2**  
**(6H)**



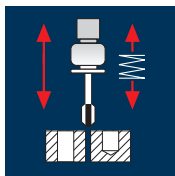
**Cu**  
Copper

## CuZn Brass

[illegible]

CF

## Application



## Matières

Aciers  
< 850 N/mm<sup>2</sup>  
A<sub>S</sub> > 10%

| M   | ø<br>[mm] | P<br>[mm] | V <sub>c</sub><br>1.0 x d | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] | V <sub>c</sub><br>1.5 x d | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] | V <sub>c</sub><br>2.0 x d | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] |
|-----|-----------|-----------|---------------------------|---------------------------|--------------------------|---------------------------|---------------------------|--------------------------|---------------------------|---------------------------|--------------------------|
| M 3 | 3.0       | 0.50      | 35                        | 3715                      | 1858                     | 30                        | 3185                      | 1593                     | 25                        | 2655                      | 1328                     |
| M 4 | 4.0       | 0.70      | 35                        | 2785                      | 1949                     | 30                        | 2385                      | 1670                     | 25                        | 1990                      | 1393                     |
| M 5 | 5.0       | 0.80      | 35                        | 2230                      | 1784                     | 30                        | 1910                      | 1528                     | 25                        | 1590                      | 1272                     |
| M 6 | 6.0       | 1.00      | 35                        | 1855                      | 1855                     | 30                        | 1590                      | 1590                     | 25                        | 1325                      | 1325                     |
| M 8 | 8.0       | 1.25      | 35                        | 1395                      | 1744                     | 30                        | 1195                      | 1494                     | 25                        | 995                       | 1244                     |
| M10 | 10.0      | 1.50      | 35                        | 1115                      | 1673                     | 30                        | 955                       | 1433                     | 25                        | 795                       | 1193                     |
| M12 | 12.0      | 1.75      | 35                        | 930                       | 1628                     | 30                        | 795                       | 1391                     | 25                        | 665                       | 1164                     |

Aciers  
850 - 1100 N/mm<sup>2</sup>  
A<sub>S</sub> > 10%

|     |      |      |    |      |      |    |      |      |    |      |      |
|-----|------|------|----|------|------|----|------|------|----|------|------|
| M 3 | 3.0  | 0.50 | 30 | 3185 | 1593 | 25 | 2655 | 1328 | 20 | 2120 | 1060 |
| M 4 | 4.0  | 0.70 | 30 | 2385 | 1670 | 25 | 1990 | 1393 | 20 | 1590 | 1113 |
| M 5 | 5.0  | 0.80 | 30 | 1910 | 1528 | 25 | 1590 | 1272 | 20 | 1275 | 1020 |
| M 6 | 6.0  | 1.00 | 30 | 1590 | 1590 | 25 | 1325 | 1325 | 20 | 1060 | 1060 |
| M 8 | 8.0  | 1.25 | 30 | 1195 | 1494 | 25 | 995  | 1244 | 20 | 795  | 994  |
| M10 | 10.0 | 1.50 | 30 | 955  | 1433 | 25 | 795  | 1193 | 20 | 635  | 953  |
| M12 | 12.0 | 1.75 | 30 | 795  | 1391 | 25 | 665  | 1164 | 20 | 530  | 928  |

Aluminium non-allié

|     |      |      |    |      |      |    |      |      |    |      |      |
|-----|------|------|----|------|------|----|------|------|----|------|------|
| M 3 | 3.0  | 0.50 | 50 | 5305 | 2653 | 40 | 4245 | 2123 | 30 | 3185 | 1593 |
| M 4 | 4.0  | 0.70 | 50 | 3980 | 2786 | 40 | 3185 | 2230 | 30 | 2385 | 1670 |
| M 5 | 5.0  | 0.80 | 50 | 3185 | 2548 | 40 | 2545 | 2036 | 30 | 1910 | 1528 |
| M 6 | 6.0  | 1.00 | 50 | 2655 | 2655 | 40 | 2120 | 2120 | 30 | 1590 | 1590 |
| M 8 | 8.0  | 1.25 | 50 | 1990 | 2488 | 40 | 1590 | 1988 | 30 | 1195 | 1494 |
| M10 | 10.0 | 1.50 | 50 | 1590 | 2385 | 40 | 1275 | 1913 | 30 | 955  | 1433 |
| M12 | 12.0 | 1.75 | 50 | 1325 | 2319 | 40 | 1060 | 1855 | 30 | 795  | 1391 |

Aluminium corroyé  
Si < 6%  
non trempé

|     |      |      |    |      |      |    |      |      |    |      |      |
|-----|------|------|----|------|------|----|------|------|----|------|------|
| M 3 | 3.0  | 0.50 | 80 | 8490 | 4245 | 60 | 6365 | 3183 | 40 | 4245 | 2123 |
| M 4 | 4.0  | 0.70 | 80 | 6365 | 4456 | 60 | 4775 | 3343 | 40 | 3185 | 2230 |
| M 5 | 5.0  | 0.80 | 80 | 5095 | 4076 | 60 | 3820 | 3056 | 40 | 2545 | 2036 |
| M 6 | 6.0  | 1.00 | 80 | 4245 | 4245 | 60 | 3185 | 3185 | 40 | 2120 | 2120 |
| M 8 | 8.0  | 1.25 | 80 | 3185 | 3981 | 60 | 2385 | 2981 | 40 | 1590 | 1988 |
| M10 | 10.0 | 1.50 | 80 | 2545 | 3818 | 60 | 1910 | 2865 | 40 | 1275 | 1913 |
| M12 | 12.0 | 1.75 | 80 | 2120 | 3710 | 60 | 1590 | 2783 | 40 | 1060 | 1855 |

## Matières

Cuivre non-allié



| M   | ø<br>[mm] | P<br>[mm] | V <sub>c</sub><br>1.0 x d | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] | V <sub>c</sub><br>1.5 x d | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] | V <sub>c</sub><br>2.0 x d | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] |
|-----|-----------|-----------|---------------------------|---------------------------|--------------------------|---------------------------|---------------------------|--------------------------|---------------------------|---------------------------|--------------------------|
| M 3 | 3.0       | 0.50      | 60                        | 6365                      | 3183                     | 40                        | 4245                      | 2123                     | 30                        | 3185                      | 1593                     |
| M 4 | 4.0       | 0.70      | 60                        | 4775                      | 3343                     | 40                        | 3185                      | 2230                     | 30                        | 2385                      | 1670                     |
| M 5 | 5.0       | 0.80      | 60                        | 3820                      | 3056                     | 40                        | 2545                      | 2036                     | 30                        | 1910                      | 1528                     |
| M 6 | 6.0       | 1.00      | 60                        | 3185                      | 3185                     | 40                        | 2120                      | 2120                     | 30                        | 1590                      | 1590                     |
| M 8 | 8.0       | 1.25      | 60                        | 2385                      | 2981                     | 40                        | 1590                      | 1988                     | 30                        | 1195                      | 1494                     |
| M10 | 10.0      | 1.50      | 60                        | 1910                      | 2865                     | 40                        | 1275                      | 1913                     | 30                        | 955                       | 1433                     |
| M12 | 12.0      | 1.75      | 60                        | 1590                      | 2783                     | 40                        | 1060                      | 1855                     | 30                        | 795                       | 1391                     |

Métaux non ferreux  
A<sub>S</sub> > 15%



|     |      |      |    |      |      |    |      |      |    |      |      |
|-----|------|------|----|------|------|----|------|------|----|------|------|
| M 3 | 3.0  | 0.50 | 50 | 5305 | 2653 | 30 | 3185 | 1593 | 25 | 2655 | 1328 |
| M 4 | 4.0  | 0.70 | 50 | 3980 | 2786 | 30 | 2385 | 1670 | 25 | 1990 | 1393 |
| M 5 | 5.0  | 0.80 | 50 | 3185 | 2548 | 30 | 1910 | 1528 | 25 | 1590 | 1272 |
| M 6 | 6.0  | 1.00 | 50 | 2655 | 2655 | 30 | 1590 | 1590 | 25 | 1325 | 1325 |
| M 8 | 8.0  | 1.25 | 50 | 1990 | 2488 | 30 | 1195 | 1494 | 25 | 995  | 1244 |
| M10 | 10.0 | 1.50 | 50 | 1590 | 2385 | 30 | 955  | 1433 | 25 | 795  | 1193 |
| M12 | 12.0 | 1.75 | 50 | 1325 | 2319 | 30 | 795  | 1391 | 25 | 665  | 1164 |

Aciers inoxydables  
ferritique/martensitique  
A<sub>S</sub> > 10%



|     |      |      |    |      |      |    |      |      |    |      |      |
|-----|------|------|----|------|------|----|------|------|----|------|------|
| M 3 | 3.0  | 0.50 | 30 | 3185 | 1593 | 25 | 2655 | 1328 | 20 | 2120 | 1060 |
| M 4 | 4.0  | 0.70 | 30 | 2385 | 1670 | 25 | 1990 | 1393 | 20 | 1590 | 1113 |
| M 5 | 5.0  | 0.80 | 30 | 1910 | 1528 | 25 | 1590 | 1272 | 20 | 1275 | 1020 |
| M 6 | 6.0  | 1.00 | 30 | 1590 | 1590 | 25 | 1325 | 1325 | 20 | 1060 | 1060 |
| M 8 | 8.0  | 1.25 | 30 | 1195 | 1494 | 25 | 995  | 1244 | 20 | 795  | 994  |
| M10 | 10.0 | 1.50 | 30 | 955  | 1433 | 25 | 795  | 1193 | 20 | 635  | 953  |
| M12 | 12.0 | 1.75 | 30 | 795  | 1391 | 25 | 665  | 1164 | 20 | 530  | 928  |

Aciers inoxydables  
[Cr-Ni/1.4301]



|     |      |      |    |      |      |    |      |      |    |      |      |
|-----|------|------|----|------|------|----|------|------|----|------|------|
| M 3 | 3.0  | 0.50 | 30 | 3185 | 1593 | 25 | 2655 | 1328 | 20 | 2120 | 1060 |
| M 4 | 4.0  | 0.70 | 30 | 2385 | 1670 | 25 | 1990 | 1393 | 20 | 1590 | 1113 |
| M 5 | 5.0  | 0.80 | 30 | 1910 | 1528 | 25 | 1590 | 1272 | 20 | 1275 | 1020 |
| M 6 | 6.0  | 1.00 | 30 | 1590 | 1590 | 25 | 1325 | 1325 | 20 | 1060 | 1060 |
| M 8 | 8.0  | 1.25 | 30 | 1195 | 1494 | 25 | 995  | 1244 | 20 | 795  | 994  |
| M10 | 10.0 | 1.50 | 30 | 955  | 1433 | 25 | 795  | 1193 | 20 | 635  | 953  |
| M12 | 12.0 | 1.75 | 30 | 795  | 1391 | 25 | 665  | 1164 | 20 | 530  | 928  |

Tarauds à refouler duroform

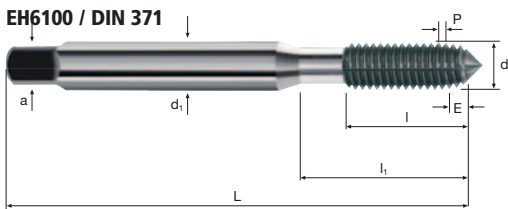


M

ISO 2  
(6H)

HM  
MG10

Form E



Rm  
< 850

Rm  
850-1100

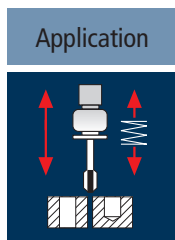
Inox  
Stainless

Aluminium  
Copper

| Exemple: N° cde |     |      |     |    |                |                |     |   |      | TiCN   |   |
|-----------------|-----|------|-----|----|----------------|----------------|-----|---|------|--------|---|
|                 |     |      |     |    |                |                |     |   |      | EH6100 |   |
| Ø<br>Code       | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   |      |        |   |
| .044            | M 3 | 0.50 | 56  | 12 | 18             | 3.5            | 2.7 | 3 | 2.80 |        | ● |
| .058            | M 4 | 0.70 | 63  | 13 | 21             | 4.5            | 3.4 | 4 | 3.70 |        | ● |
| .084            | M 5 | 0.80 | 70  | 15 | 25             | 6.0            | 4.9 | 4 | 4.60 |        | ● |
| .088            | M 6 | 1.00 | 80  | 17 | 30             | 6.0            | 4.9 | 4 | 5.50 |        | ● |
| .160            | M 8 | 1.25 | 90  | 20 | 35             | 8.0            | 6.2 | 5 | 7.40 |        | ● |
| .174            | M10 | 1.50 | 100 | 22 | 39             | 10.0           | 8.0 | 5 | 9.30 |        | ● |
|                 |     |      |     |    |                |                |     |   |      |        |   |
|                 |     |      |     |    |                |                |     |   |      |        |   |
|                 |     |      |     |    |                |                |     |   |      |        |   |

| Exemple: N° cde |     |      |     |    |                |                |     |   |       | TiCN   |   |
|-----------------|-----|------|-----|----|----------------|----------------|-----|---|-------|--------|---|
|                 |     |      |     |    |                |                |     |   |       | EH6101 |   |
| Ø<br>Code       | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   |       |        |   |
| .240            | M12 | 1.75 | 110 | 24 | 50             | 9.0            | 7.0 | 7 | 11.20 |        | ● |
|                 |     |      |     |    |                |                |     |   |       |        |   |
|                 |     |      |     |    |                |                |     |   |       |        |   |
|                 |     |      |     |    |                |                |     |   |       |        |   |
|                 |     |      |     |    |                |                |     |   |       |        |   |
|                 |     |      |     |    |                |                |     |   |       |        |   |
|                 |     |      |     |    |                |                |     |   |       |        |   |

CF



**Application**

**Matières**

Aciers  
< 850 N/mm<sup>2</sup>  
A<sub>S</sub> > 10%

Aciers  
< 850 N/mm<sup>2</sup>  
A<sub>S</sub> > 10%

Aciers  
850 - 1100 N/mm<sup>2</sup>  
A<sub>S</sub> > 10%

Aciers  
850 - 1100 N/mm<sup>2</sup>  
A<sub>S</sub> > 10%

| M     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-------|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
| M 1   | 1.0       | 0.25      | 20               | 6365                      | 1591            | 15               | 4775                      | 1194            | 10               | 3185                      | 796             |
| M 1.2 | 1.2       | 0.25      | 20               | 5305                      | 1326            | 15               | 3980                      | 995             | 10               | 2655                      | 664             |
| M 1.4 | 1.4       | 0.30      | 20               | 4545                      | 1364            | 15               | 3410                      | 1023            | 10               | 2275                      | 683             |
| M 1.6 | 1.6       | 0.35      | 20               | 3980                      | 1393            | 15               | 2985                      | 1045            | 10               | 1990                      | 697             |
| M 1.8 | 1.8       | 0.35      | 20               | 3535                      | 1237            | 15               | 2655                      | 929             | 10               | 1770                      | 620             |
| M 2   | 2.0       | 0.40      | 20               | 3185                      | 1274            | 15               | 2385                      | 954             | 10               | 1590                      | 636             |
| M 2.2 | 2.2       | 0.45      | 20               | 2895                      | 1303            | 15               | 2170                      | 977             | 10               | 1445                      | 650             |
| M 2.5 | 2.5       | 0.45      | 20               | 2545                      | 1145            | 15               | 1910                      | 860             | 10               | 1275                      | 574             |
| M 3   | 3.0       | 0.50      | 20               | 2120                      | 1060            | 15               | 1590                      | 795             | 10               | 1060                      | 530             |
| M 4   | 4.0       | 0.70      | 20               | 1590                      | 1113            | 15               | 1195                      | 837             | 10               | 795                       | 557             |
| M 5   | 5.0       | 0.80      | 20               | 1275                      | 1020            | 15               | 955                       | 764             | 10               | 635                       | 508             |
| M 6   | 6.0       | 1.00      | 20               | 1060                      | 1060            | 15               | 795                       | 795             | 10               | 530                       | 530             |
| M 8   | 8.0       | 1.25      | 20               | 795                       | 994             | 15               | 595                       | 744             | 10               | 400                       | 500             |
| M 10  | 10.0      | 1.50      | 20               | 635                       | 953             | 15               | 475                       | 713             | 10               | 320                       | 480             |
|       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |
|       |           |           |                  |                           |                 |                  |                           |                 |                  |                           |                 |

|       |      |      |    |      |      |    |      |     |  |  |  |
|-------|------|------|----|------|------|----|------|-----|--|--|--|
| M 1   | 1.0  | 0.25 | 15 | 4775 | 1194 | 10 | 3185 | 796 |  |  |  |
| M 1.2 | 1.2  | 0.25 | 15 | 3980 | 995  | 10 | 2655 | 664 |  |  |  |
| M 1.4 | 1.4  | 0.30 | 15 | 3410 | 1023 | 10 | 2275 | 683 |  |  |  |
| M 1.6 | 1.6  | 0.35 | 15 | 2985 | 1045 | 10 | 1990 | 697 |  |  |  |
| M 1.8 | 1.8  | 0.35 | 15 | 2655 | 929  | 10 | 1770 | 620 |  |  |  |
| M 2   | 2.0  | 0.40 | 15 | 2385 | 954  | 10 | 1590 | 636 |  |  |  |
| M 2.2 | 2.2  | 0.45 | 15 | 2170 | 977  | 10 | 1445 | 650 |  |  |  |
| M 2.5 | 2.5  | 0.45 | 15 | 1910 | 860  | 10 | 1275 | 574 |  |  |  |
| M 3   | 3.0  | 0.50 | 15 | 1590 | 795  | 10 | 1060 | 530 |  |  |  |
| M 4   | 4.0  | 0.70 | 15 | 1195 | 837  | 10 | 795  | 557 |  |  |  |
| M 5   | 5.0  | 0.80 | 15 | 955  | 764  | 10 | 635  | 508 |  |  |  |
| M 6   | 6.0  | 1.00 | 15 | 795  | 795  | 10 | 530  | 530 |  |  |  |
| M 8   | 8.0  | 1.25 | 15 | 595  | 744  | 10 | 400  | 500 |  |  |  |
| M 10  | 10.0 | 1.50 | 15 | 475  | 713  | 10 | 320  | 480 |  |  |  |
|       |      |      |    |      |      |    |      |     |  |  |  |
|       |      |      |    |      |      |    |      |     |  |  |  |
|       |      |      |    |      |      |    |      |     |  |  |  |

**Matières**

Aciers inoxydables  
ferritique/martensitique  
A<sub>S</sub> > 10%

Aciers inoxydables  
ferritique/martensitique  
A<sub>S</sub> > 10%

Aciers inoxydables  
[Cr-Ni/1.4301]

Aciers inoxydables  
[Cr-Ni/1.4301]

| M     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |  |
|-------|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|--|
| M 1   | 1.0       | 0.25      | 15               | 4775                      | 1194            | 10               | 3185                      | 796             |  |
| M 1.2 | 1.2       | 0.25      | 15               | 3980                      | 995             | 10               | 2655                      | 664             |  |
| M 1.4 | 1.4       | 0.30      | 15               | 3410                      | 1023            | 10               | 2275                      | 683             |  |
| M 1.6 | 1.6       | 0.35      | 15               | 2985                      | 1045            | 10               | 1990                      | 697             |  |
| M 1.8 | 1.8       | 0.35      | 15               | 2655                      | 929             | 10               | 1770                      | 620             |  |
| M 2   | 2.0       | 0.40      | 15               | 2385                      | 954             | 10               | 1590                      | 636             |  |
| M 2.2 | 2.2       | 0.45      | 15               | 2170                      | 977             | 10               | 1445                      | 650             |  |
| M 2.5 | 2.5       | 0.45      | 15               | 1910                      | 860             | 10               | 1275                      | 574             |  |
| M 3   | 3.0       | 0.50      | 15               | 1590                      | 795             | 10               | 1060                      | 530             |  |
| M 4   | 4.0       | 0.70      | 15               | 1195                      | 837             | 10               | 795                       | 557             |  |
| M 5   | 5.0       | 0.80      | 15               | 955                       | 764             | 10               | 635                       | 508             |  |
| M 6   | 6.0       | 1.00      | 15               | 795                       | 795             | 10               | 530                       | 530             |  |
| M 8   | 8.0       | 1.25      | 15               | 595                       | 744             | 10               | 400                       | 500             |  |
| M 10  | 10.0      | 1.50      | 15               | 475                       | 713             | 10               | 320                       | 480             |  |
|       |           |           |                  |                           |                 |                  |                           |                 |  |
|       |           |           |                  |                           |                 |                  |                           |                 |  |
|       |           |           |                  |                           |                 |                  |                           |                 |  |
| M 1   | 1.0       | 0.25      | 15               | 4775                      | 1194            | 10               | 3185                      | 796             |  |
| M 1.2 | 1.2       | 0.25      | 15               | 3980                      | 995             | 10               | 2655                      | 664             |  |
| M 1.4 | 1.4       | 0.30      | 15               | 3410                      | 1023            | 10               | 2275                      | 683             |  |
| M 1.6 | 1.6       | 0.35      | 15               | 2985                      | 1045            | 10               | 1990                      | 697             |  |
| M 1.8 | 1.8       | 0.35      | 15               | 2655                      | 929             | 10               | 1770                      | 620             |  |
| M 2   | 2.0       | 0.40      | 15               | 2385                      | 954             | 10               | 1590                      | 636             |  |
| M 2.2 | 2.2       | 0.45      | 15               | 2170                      | 977             | 10               | 1445                      | 650             |  |
| M 2.5 | 2.5       | 0.45      | 15               | 1910                      | 860             | 10               | 1275                      | 574             |  |
| M 3   | 3.0       | 0.50      | 15               | 1590                      | 795             | 10               | 1060                      | 530             |  |
| M 4   | 4.0       | 0.70      | 15               | 1195                      | 837             | 10               | 795                       | 557             |  |
| M 5   | 5.0       | 0.80      | 15               | 955                       | 764             | 10               | 635                       | 508             |  |
| M 6   | 6.0       | 1.00      | 15               | 795                       | 795             | 10               | 530                       | 530             |  |
| M 8   | 8.0       | 1.25      | 15               | 595                       | 744             | 10               | 400                       | 500             |  |
| M 10  | 10.0      | 1.50      | 15               | 475                       | 713             | 10               | 320                       | 480             |  |
|       |           |           |                  |                           |                 |                  |                           |                 |  |
|       |           |           |                  |                           |                 |                  |                           |                 |  |
|       |           |           |                  |                           |                 |                  |                           |                 |  |



Technical drawing of a screwdriver with dimensions. The drawing shows a side view of the screwdriver with the following dimensions labeled:  $a$  (width of the handle),  $d_1$  (diameter of the handle),  $L$  (total length),  $P$  (pitch of the threads),  $c$  (height of the tip),  $E$  (width of the tip),  $l$  (length of the threaded part), and  $l_1$  (length of the shaft).

**ISO 2  
(6H)**

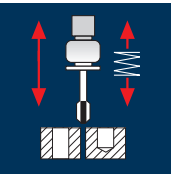


**Rm**  
850-1100

**Inox**  
Stainless

CF

## Application



## Matières

Aciers  
 $< 850 \text{ N/mm}^2$   
 $A_5 > 10\%$

[illegible]



Technical drawing of a double-flute drill bit. The drawing shows the bit from the side, with dimensions labeled. The total length is  $L$ . The diameter of the main body is  $d_1$ . The diameter of the cutting edge is  $d$ . The length of the cutting edge is  $l_1$ . The length of the flute is  $l$ . The length of the cutting edge is  $E$ . The length of the cutting edge is  $P$ . The length of the cutting edge is  $C$ . The length of the cutting edge is  $a$ .

**ISO 2**  
**(6H)**

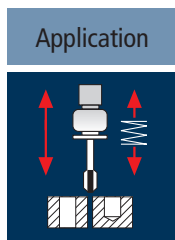


**Rm**  
850-1100

**Inox**  
Stainless

[illegible]

CF



**Application**

**Matières**

Aciers  
 $< 850 \text{ N/mm}^2$   
 $A_s > 10\%$

| M     | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $V_c$<br>3.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-------|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|
| M 1   | 1.0       | 0.25      | 20               | 6365                      | 1591            | 15               | 4775                      | 1194            | 10               | 3185                      | 796             |
| M 1.2 | 1.2       | 0.25      | 20               | 5305                      | 1326            | 15               | 3980                      | 995             | 10               | 2655                      | 664             |
| M 1.4 | 1.4       | 0.30      | 20               | 4545                      | 1364            | 15               | 3410                      | 1023            | 10               | 2275                      | 683             |
| M 1.6 | 1.6       | 0.35      | 20               | 3980                      | 1393            | 15               | 2985                      | 1045            | 10               | 1990                      | 697             |
| M 1.8 | 1.8       | 0.35      | 20               | 3535                      | 1237            | 15               | 2655                      | 929             | 10               | 1770                      | 620             |
| M 2   | 2.0       | 0.40      | 20               | 3185                      | 1274            | 15               | 2385                      | 954             | 10               | 1590                      | 636             |
| M 2.2 | 2.2       | 0.45      | 20               | 2895                      | 1303            | 15               | 2170                      | 977             | 10               | 1445                      | 650             |
| M 2.5 | 2.5       | 0.45      | 20               | 2545                      | 1145            | 15               | 1910                      | 860             | 10               | 1275                      | 574             |
| M 3   | 3.0       | 0.50      | 20               | 2120                      | 1060            | 15               | 1590                      | 795             | 10               | 1060                      | 530             |

Aciers  
 $< 850 \text{ N/mm}^2$   
 $A_s > 10\%$

|     |      |      |    |      |      |    |      |     |    |     |     |
|-----|------|------|----|------|------|----|------|-----|----|-----|-----|
| M 4 | 4.0  | 0.70 | 20 | 1590 | 1113 | 15 | 1195 | 837 | 10 | 795 | 557 |
| M 5 | 5.0  | 0.80 | 20 | 1275 | 1020 | 15 | 955  | 764 | 10 | 635 | 508 |
| M 6 | 6.0  | 1.00 | 20 | 1060 | 1060 | 15 | 795  | 795 | 10 | 530 | 530 |
| M 8 | 8.0  | 1.25 | 20 | 795  | 994  | 15 | 595  | 744 | 10 | 400 | 500 |
| M10 | 10.0 | 1.50 | 20 | 635  | 953  | 15 | 475  | 713 | 10 | 320 | 480 |

Aciers  
 $850 - 1100 \text{ N/mm}^2$   
 $A_s > 10\%$

|       |     |      |    |      |      |    |      |     |  |  |  |
|-------|-----|------|----|------|------|----|------|-----|--|--|--|
| M 1   | 1.0 | 0.25 | 15 | 4775 | 1194 | 10 | 3185 | 796 |  |  |  |
| M 1.2 | 1.2 | 0.25 | 15 | 3980 | 995  | 10 | 2655 | 664 |  |  |  |
| M 1.4 | 1.4 | 0.30 | 15 | 3410 | 1023 | 10 | 2275 | 683 |  |  |  |
| M 1.6 | 1.6 | 0.35 | 15 | 2985 | 1045 | 10 | 1990 | 697 |  |  |  |
| M 1.8 | 1.8 | 0.35 | 15 | 2655 | 929  | 10 | 1770 | 620 |  |  |  |
| M 2   | 2.0 | 0.40 | 15 | 2385 | 954  | 10 | 1590 | 636 |  |  |  |
| M 2.2 | 2.2 | 0.45 | 15 | 2170 | 977  | 10 | 1445 | 650 |  |  |  |
| M 2.5 | 2.5 | 0.45 | 15 | 1910 | 860  | 10 | 1275 | 574 |  |  |  |
| M 3   | 3.0 | 0.50 | 15 | 1590 | 795  | 10 | 1060 | 530 |  |  |  |

Aciers  
 $850 - 1100 \text{ N/mm}^2$   
 $A_s > 10\%$

|     |      |      |    |      |     |    |     |     |  |  |  |
|-----|------|------|----|------|-----|----|-----|-----|--|--|--|
| M 4 | 4.0  | 0.70 | 15 | 1195 | 837 | 10 | 795 | 557 |  |  |  |
| M 5 | 5.0  | 0.80 | 15 | 955  | 764 | 10 | 635 | 508 |  |  |  |
| M6  | 6.0  | 1.00 | 15 | 795  | 795 | 10 | 530 | 530 |  |  |  |
| M8  | 8.0  | 1.25 | 15 | 595  | 744 | 10 | 400 | 500 |  |  |  |
| M10 | 10.0 | 1.50 | 15 | 475  | 713 | 10 | 320 | 480 |  |  |  |

**Matières**

Aciers inoxydables  
ferritique/martensitique  
 $A_s > 10\%$

Aciers inoxydables  
ferritique/martensitique  
 $A_s > 10\%$

Aciers inoxydables  
[Cr-Ni/1.4301]

Aciers inoxydables  
[Cr-Ni/1.4301]

| M     | ø<br>[mm] | P<br>[mm] | $V_c$<br>1.5 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $V_c$<br>2.0 x d | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |  |
|-------|-----------|-----------|------------------|---------------------------|-----------------|------------------|---------------------------|-----------------|--|
| M 1   | 1.0       | 0.25      | 15               | 4775                      | 1194            | 10               | 3185                      | 796             |  |
| M 1.2 | 1.2       | 0.25      | 15               | 3980                      | 995             | 10               | 2655                      | 664             |  |
| M 1.4 | 1.4       | 0.30      | 15               | 3410                      | 1023            | 10               | 2275                      | 683             |  |
| M 1.6 | 1.6       | 0.35      | 15               | 2985                      | 1045            | 10               | 1990                      | 697             |  |
| M 1.8 | 1.8       | 0.35      | 15               | 2655                      | 929             | 10               | 1770                      | 620             |  |
| M 2   | 2.0       | 0.40      | 15               | 2385                      | 954             | 10               | 1590                      | 636             |  |
| M 2.2 | 2.2       | 0.45      | 15               | 2170                      | 977             | 10               | 1445                      | 650             |  |
| M 2.5 | 2.5       | 0.45      | 15               | 1910                      | 860             | 10               | 1275                      | 574             |  |
| M 3   | 3.0       | 0.50      | 15               | 1590                      | 795             | 10               | 1060                      | 530             |  |
| M 4   | 4.0       | 0.70      | 15               | 1195                      | 837             | 10               | 795                       | 557             |  |
| M 5   | 5.0       | 0.80      | 15               | 955                       | 764             | 10               | 635                       | 508             |  |
| M 6   | 6.0       | 1.00      | 15               | 795                       | 795             | 10               | 530                       | 530             |  |
| M 8   | 8.0       | 1.25      | 15               | 595                       | 744             | 10               | 400                       | 500             |  |
| M10   | 10.0      | 1.50      | 15               | 475                       | 713             | 10               | 320                       | 480             |  |
| M 1   | 1.0       | 0.25      | 15               | 4775                      | 1194            | 10               | 3185                      | 796             |  |
| M 1.2 | 1.2       | 0.25      | 15               | 3980                      | 995             | 10               | 2655                      | 664             |  |
| M 1.4 | 1.4       | 0.30      | 15               | 3410                      | 1023            | 10               | 2275                      | 683             |  |
| M 1.6 | 1.6       | 0.35      | 15               | 2985                      | 1045            | 10               | 1990                      | 697             |  |
| M 1.8 | 1.8       | 0.35      | 15               | 2655                      | 929             | 10               | 1770                      | 620             |  |
| M 2   | 2.0       | 0.40      | 15               | 2385                      | 954             | 10               | 1590                      | 636             |  |
| M 2.2 | 2.2       | 0.45      | 15               | 2170                      | 977             | 10               | 1445                      | 650             |  |
| M 2.5 | 2.5       | 0.45      | 15               | 1910                      | 860             | 10               | 1275                      | 574             |  |
| M 3   | 3.0       | 0.50      | 15               | 1590                      | 795             | 10               | 1060                      | 530             |  |
| M 4   | 4.0       | 0.70      | 15               | 1195                      | 837             | 10               | 795                       | 557             |  |
| M 5   | 5.0       | 0.80      | 15               | 955                       | 764             | 10               | 635                       | 508             |  |
| M 6   | 6.0       | 1.00      | 15               | 795                       | 795             | 10               | 530                       | 530             |  |
| M 8   | 8.0       | 1.25      | 15               | 595                       | 744             | 10               | 400                       | 500             |  |
| M10   | 10.0      | 1.50      | 15               | 475                       | 713             | 10               | 320                       | 480             |  |





Technical drawing of a screwdriver. The drawing shows a side view of the tool. Key dimensions and labels include:
 

- $a$ : Diameter of the handle end.
- $d_1$ : Diameter of the main shaft.
- $L$ : Total length of the screwdriver.
- $l_1$ : Length of the shaft section.
- $l$ : Length of the threaded section.
- $P$ : Pitch of the thread.
- $E$ : Width of the blade.
- $C$ : Length of the blade.

**ISO 2  
(6H)**



**HSS  
PM/F**

DIN  
371

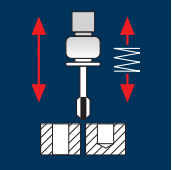
Form E

**Rm**  
**< 850**

**Rm**  
850-1100

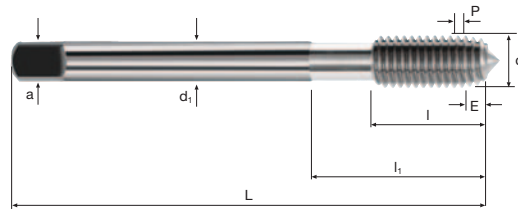
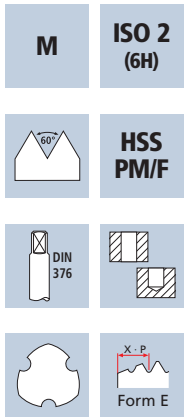
**Inox**  
Stainless

CF

| Application                                                                       | Matières                                                       | M   | ø    | P    | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------|-----|------|------|----------------|----------------------|--------|----------------|----------------------|--------|----------------|----------------------|--------|
|                                                                                   |                                                                |     | [mm] | [mm] | $1.5 \times d$ | [min <sup>-1</sup> ] | [100%] | $2.0 \times d$ | [min <sup>-1</sup> ] | [100%] | $3.0 \times d$ | [min <sup>-1</sup> ] | [100%] |
|   | Aciers<br>$< 850 \text{ N/mm}^2$<br>$A_5 > 10\%$               | M12 | 12.0 | 1.75 | 20             | 530                  | 928    | 15             | 400                  | 700    | 10             | 265                  | 464    |
|                                                                                   |                                                                | M14 | 14.0 | 2.00 | 20             | 455                  | 910    | 15             | 340                  | 680    | 10             | 225                  | 450    |
|                                                                                   |                                                                | M16 | 16.0 | 2.00 | 20             | 400                  | 800    | 15             | 300                  | 600    | 10             | 200                  | 400    |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |                |                      |        |
|  | Aciers<br>$850 - 1100 \text{ N/mm}^2$<br>$A_5 > 10\%$          | M12 | 12.0 | 1.75 | 15             | 400                  | 700    | 10             | 265                  | 464    |                |                      |        |
|                                                                                   |                                                                | M14 | 14.0 | 2.00 | 15             | 340                  | 680    | 10             | 225                  | 450    |                |                      |        |
|                                                                                   |                                                                | M16 | 16.0 | 2.00 | 15             | 300                  | 600    | 10             | 200                  | 400    |                |                      |        |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |                |                      |        |
|  | Aciers inoxydables<br>ferritique/martensitique<br>$A_5 > 10\%$ | M12 | 12.0 | 1.75 | 15             | 400                  | 700    | 10             | 265                  | 464    |                |                      |        |
|                                                                                   |                                                                | M14 | 14.0 | 2.00 | 15             | 340                  | 680    | 10             | 225                  | 450    |                |                      |        |
|                                                                                   |                                                                | M16 | 16.0 | 2.00 | 15             | 300                  | 600    | 10             | 200                  | 400    |                |                      |        |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |                |                      |        |
|  | Aciers inoxydables<br>[Cr-Ni/1.4301]                           | M12 | 12.0 | 1.75 | 15             | 400                  | 700    | 10             | 265                  | 464    |                |                      |        |
|                                                                                   |                                                                | M14 | 14.0 | 2.00 | 15             | 340                  | 680    | 10             | 225                  | 450    |                |                      |        |
|                                                                                   |                                                                | M16 | 16.0 | 2.00 | 15             | 300                  | 600    | 10             | 200                  | 400    |                |                      |        |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |                |                      |        |



**new  
quality**



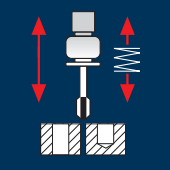
**Rm**  
**< 850**

**Rm**  
850-1100

**Inox**  
Stainless

[illegible]

CF

| Application                                                                       | Matières                                                       |     |      |      |                |                      |        |                |                      |        |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------|-----|------|------|----------------|----------------------|--------|----------------|----------------------|--------|
|                                                                                   |                                                                | M   | ø    | P    | $v_c$          | n                    | $v_f$  | $v_c$          | n                    | $v_f$  |
|                                                                                   |                                                                |     | [mm] | [mm] | $1.5 \times d$ | [min <sup>-1</sup> ] | [100%] | $2.0 \times d$ | [min <sup>-1</sup> ] | [100%] |
|                                                                                   |                                                                |     |      |      | $3.0 \times d$ | [min <sup>-1</sup> ] | [100%] |                |                      |        |
|   | Aciers<br>$< 850 \text{ N/mm}^2$<br>$A_S > 10\%$               | M 6 | 6.0  | 1.00 | 25             | 1325                 | 1325   | 20             | 1060                 | 1060   |
|                                                                                   |                                                                | M 8 | 8.0  | 1.25 | 25             | 995                  | 1244   | 20             | 795                  | 994    |
|                                                                                   |                                                                | M10 | 10.0 | 1.50 | 25             | 795                  | 1193   | 20             | 635                  | 953    |
|                                                                                   |                                                                | M12 | 12.0 | 1.75 | 25             | 665                  | 1164   | 20             | 530                  | 928    |
|                                                                                   |                                                                | M14 | 14.0 | 2.00 | 25             | 570                  | 1140   | 20             | 455                  | 910    |
|  | Aciers<br>$850 - 1100 \text{ N/mm}^2$<br>$A_S > 10\%$          | M16 | 16.0 | 2.00 | 25             | 495                  | 990    | 20             | 400                  | 800    |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |
|  | Aciers inoxydables<br>ferritique/martensitique<br>$A_S > 10\%$ | M 6 | 6.0  | 1.00 | 15             | 795                  | 795    | 10             | 530                  | 530    |
|                                                                                   |                                                                | M 8 | 8.0  | 1.25 | 15             | 595                  | 744    | 10             | 400                  | 500    |
|                                                                                   |                                                                | M10 | 10.0 | 1.50 | 15             | 475                  | 713    | 10             | 320                  | 480    |
|                                                                                   |                                                                | M12 | 12.0 | 1.75 | 15             | 400                  | 700    | 10             | 265                  | 464    |
|                                                                                   |                                                                | M14 | 14.0 | 2.00 | 15             | 340                  | 680    | 10             | 225                  | 450    |
|  | Aciers inoxydables<br>[Cr-Ni/1.4301]                           | M16 | 16.0 | 2.00 | 15             | 300                  | 600    | 10             | 200                  | 400    |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |
|                                                                                   |                                                                |     |      |      |                |                      |        |                |                      |        |

# Tarauds à refouler

Incool

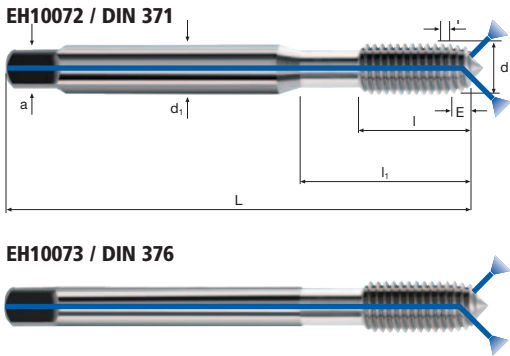


M

ISO 2  
(6H)

HSS  
PM/F

Form E



|             |                |  |  |  |  |  |                   |  |  |
|-------------|----------------|--|--|--|--|--|-------------------|--|--|
| Rm<br>< 850 | Rm<br>850-1100 |  |  |  |  |  | Inox<br>Stainless |  |  |
|-------------|----------------|--|--|--|--|--|-------------------|--|--|

| Exemple: N° cde |     |      |     |    |    |    |     |   |      | TiCN    |
|-----------------|-----|------|-----|----|----|----|-----|---|------|---------|
| N° d'article    |     |      |     |    |    |    |     |   |      | EH10072 |
| Code-ø          |     |      |     |    |    |    |     |   |      |         |
| ø<br>Code       | d   | P    | L   | l  | l1 | d1 | a   |   |      |         |
| .088            | M 6 | 1.00 | 80  | 17 | 30 | 6  | 4.9 | 4 | 5.50 | ●       |
| .160            | M 8 | 1.25 | 90  | 20 | 35 | 8  | 6.2 | 5 | 7.40 | ●       |
| .174            | M10 | 1.50 | 100 | 22 | 39 | 10 | 8.0 | 5 | 9.30 | ●       |
|                 |     |      |     |    |    |    |     |   |      |         |
|                 |     |      |     |    |    |    |     |   |      |         |
|                 |     |      |     |    |    |    |     |   |      |         |
|                 |     |      |     |    |    |    |     |   |      |         |
|                 |     |      |     |    |    |    |     |   |      |         |
|                 |     |      |     |    |    |    |     |   |      |         |

| Exemple: N° cde |     |      |     |    |    |    |     |   |       | TiCN    |
|-----------------|-----|------|-----|----|----|----|-----|---|-------|---------|
| N° d'article    |     |      |     |    |    |    |     |   |       | EH10073 |
| Code-ø          |     |      |     |    |    |    |     |   |       |         |
| ø<br>Code       | d   | P    | L   | l  | l1 | d1 | a   |   |       |         |
| .240            | M12 | 1.75 | 110 | 24 | 50 | 9  | 7.0 | 7 | 11.20 | ●       |
| .244            | M14 | 2.00 | 110 | 26 | 58 | 11 | 9.0 | 7 | 13.10 | ●       |
| .246            | M16 | 2.00 | 110 | 27 | 58 | 12 | 9.0 | 7 | 15.10 | ●       |
|                 |     |      |     |    |    |    |     |   |       |         |
|                 |     |      |     |    |    |    |     |   |       |         |
|                 |     |      |     |    |    |    |     |   |       |         |
|                 |     |      |     |    |    |    |     |   |       |         |
|                 |     |      |     |    |    |    |     |   |       |         |

CF

## Application

# Matières

## Aluminium non-allié

[illegible]

**Matières**

**Cuivre non-allié**



[illegible]

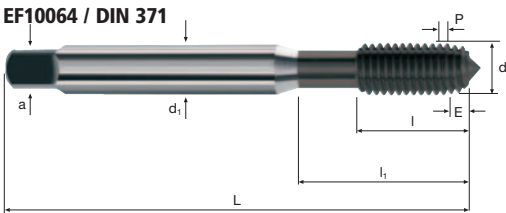


M

ISO 3  
(6G)

HSS  
PM/F

Form E



Al  
Aluminium  
> 99%

Al  
Aluminium  
Alloy

Cu  
Copper

CuZn Brass

| Exemple: N° cde     |       |      |     |    |                |                |     |   |      | F-DLC   |   |
|---------------------|-------|------|-----|----|----------------|----------------|-----|---|------|---------|---|
| N° d'article Code-ø |       |      |     |    |                |                |     |   |      | EF10064 |   |
| ø Code              | d     | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   |      |         |   |
| .034                | M 2   | 0.40 | 45  | 8  | —              | 2.8            | 2.1 | 3 | 1.80 |         | ● |
| .036                | M 2.2 | 0.45 | 45  | 9  | —              | 2.8            | 2.1 | 3 | 2.00 |         | ● |
| .040                | M 2.5 | 0.45 | 50  | 9  | —              | 2.8            | 2.1 | 3 | 2.30 |         | ● |
| .044                | M 3   | 0.50 | 56  | 12 | 18.0           | 3.5            | 2.7 | 3 | 2.80 |         | ● |
| .058                | M 4   | 0.70 | 63  | 13 | 21.0           | 4.5            | 3.4 | 3 | 3.70 |         | ● |
| .084                | M 5   | 0.80 | 70  | 15 | 25.0           | 6.0            | 4.9 | 4 | 4.60 |         | ● |
| .088                | M 6   | 1.00 | 80  | 17 | 30.0           | 6.0            | 4.9 | 4 | 5.50 |         | ● |
| .160                | M 8   | 1.25 | 90  | 20 | 35.0           | 8.0            | 6.2 | 4 | 7.40 |         | ● |
| .174                | M10   | 1.50 | 100 | 22 | 39.0           | 10.0           | 8.0 | 4 | 9.30 |         | ● |

| Exemple: N° cde     |     |      |     |    |                |                |     |   |       | F-DLC   |   |
|---------------------|-----|------|-----|----|----------------|----------------|-----|---|-------|---------|---|
| N° d'article Code-ø |     |      |     |    |                |                |     |   |       | EF10065 |   |
| ø Code              | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   |       |         |   |
| .240                | M12 | 1.75 | 110 | 24 | 40.0           | 9.0            | 7.0 | 5 | 11.20 |         | ● |
| .244                | M14 | 2.00 | 110 | 26 | 40.0           | 11.0           | 9.0 | 5 | 13.10 |         | ● |
| .246                | M16 | 2.00 | 110 | 27 | 40.0           | 12.0           | 9.0 | 5 | 15.10 |         | ● |
|                     |     |      |     |    |                |                |     |   |       |         |   |
|                     |     |      |     |    |                |                |     |   |       |         |   |
|                     |     |      |     |    |                |                |     |   |       |         |   |
|                     |     |      |     |    |                |                |     |   |       |         |   |
|                     |     |      |     |    |                |                |     |   |       |         |   |
|                     |     |      |     |    |                |                |     |   |       |         |   |





Tarauds à refouler

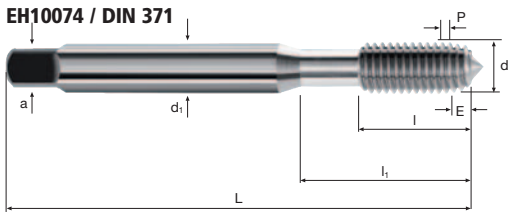


M

ISO 3  
(6G)

HSS  
PM/F

Form E



Rm  
< 850

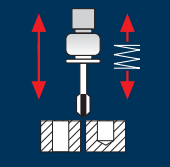
Rm  
850-1100

Inox  
Stainless

| Exemple: N° cde     |       |      |     |    |      |      |     |   |      | TiCN    |   |
|---------------------|-------|------|-----|----|------|------|-----|---|------|---------|---|
| N° d'article Code-ø |       |      |     |    |      |      |     |   |      | EH10074 |   |
| ø Code              | d     | P    | L   | l  | l1   | d1   | a   |   |      |         |   |
| .034                | M 2   | 0.40 | 45  | 8  | —    | 2.8  | 2.1 | 3 | 1.80 |         | ● |
| .036                | M 2.2 | 0.45 | 45  | 9  | —    | 2.8  | 2.1 | 3 | 2.00 |         | ● |
| .040                | M 2.5 | 0.45 | 50  | 9  | —    | 2.8  | 2.1 | 3 | 2.30 |         | ● |
| .044                | M 3   | 0.50 | 56  | 12 | 18.0 | 3.5  | 2.7 | 3 | 2.80 |         | ● |
| .058                | M 4   | 0.70 | 63  | 13 | 21.0 | 4.5  | 3.4 | 3 | 3.70 |         | ● |
| .084                | M 5   | 0.80 | 70  | 15 | 25.0 | 6.0  | 4.9 | 4 | 4.60 |         | ● |
| .088                | M 6   | 1.00 | 80  | 17 | 30.0 | 6.0  | 4.9 | 4 | 5.50 |         | ● |
| .160                | M 8   | 1.25 | 90  | 20 | 35.0 | 8.0  | 6.2 | 5 | 7.40 |         | ● |
| .174                | M10   | 1.50 | 100 | 22 | 39.0 | 10.0 | 8.0 | 5 | 9.30 |         | ● |

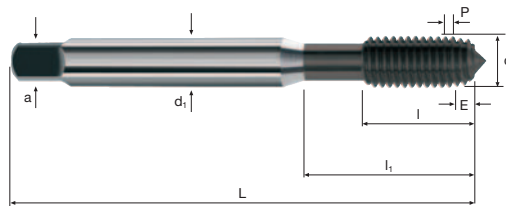
| Exemple: N° cde     |     |      |     |    |    |      |     |   |       | TiCN    |   |
|---------------------|-----|------|-----|----|----|------|-----|---|-------|---------|---|
| N° d'article Code-ø |     |      |     |    |    |      |     |   |       | EH10075 |   |
| ø Code              | d   | P    | L   | l  | l1 | d1   | a   |   |       |         |   |
| .240                | M12 | 1.75 | 110 | 24 | 40 | 9.0  | 7.0 | 7 | 11.20 |         | ● |
| .244                | M14 | 2.00 | 110 | 26 | 40 | 11.0 | 9.0 | 7 | 13.10 |         | ● |
| .246                | M16 | 2.00 | 110 | 27 | 40 | 12.0 | 9.0 | 7 | 15.10 |         | ● |
|                     |     |      |     |    |    |      |     |   |       |         |   |
|                     |     |      |     |    |    |      |     |   |       |         |   |
|                     |     |      |     |    |    |      |     |   |       |         |   |
|                     |     |      |     |    |    |      |     |   |       |         |   |
|                     |     |      |     |    |    |      |     |   |       |         |   |

CF

| Application                                                                                                                 | Matières            | M     | ø<br>[mm] | P<br>[mm] | $v_c$<br>1.5 x d<br>[m·min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>2.0 x d<br>[m·min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] | $v_c$<br>3.0 x d<br>[m·min <sup>-1</sup> ] | n<br>[min <sup>-1</sup> ] | $v_f$<br>[100%] |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------|-------|-----------|-----------|--------------------------------------------|---------------------------|-----------------|--------------------------------------------|---------------------------|-----------------|--------------------------------------------|---------------------------|-----------------|
|                                             | Aluminium non-allié | M 2   | 2.0       | 0.40      | 25                                         | 3980                      | 1592            | 20                                         | 3185                      | 1274            | 15                                         | 2385                      | 954             |
|                                                                                                                             |                     | M 2.2 | 2.2       | 0.45      | 25                                         | 3615                      | 1627            | 20                                         | 2895                      | 1303            | 15                                         | 2170                      | 977             |
|                                                                                                                             |                     | M 2.5 | 2.5       | 0.45      | 25                                         | 3185                      | 1433            | 20                                         | 2545                      | 1145            | 15                                         | 1910                      | 860             |
|                                                                                                                             |                     | M 3   | 3.0       | 0.50      | 25                                         | 2655                      | 1328            | 20                                         | 2120                      | 1060            | 15                                         | 1590                      | 795             |
|                                                                                                                             |                     | M 4   | 4.0       | 0.70      | 25                                         | 1990                      | 1393            | 20                                         | 1590                      | 1113            | 15                                         | 1195                      | 837             |
|                                                                                                                             |                     | M 5   | 5.0       | 0.80      | 25                                         | 1590                      | 1272            | 20                                         | 1275                      | 1020            | 15                                         | 955                       | 764             |
|                                                                                                                             |                     | M 6   | 6.0       | 1.00      | 25                                         | 1325                      | 1325            | 20                                         | 1060                      | 1060            | 15                                         | 795                       | 795             |
|                                                                                                                             |                     | M 8   | 8.0       | 1.25      | 25                                         | 995                       | 1244            | 20                                         | 795                       | 994             | 15                                         | 595                       | 744             |
|                                                                                                                             |                     | M10   | 10.0      | 1.50      | 25                                         | 795                       | 1193            | 20                                         | 635                       | 953             | 15                                         | 475                       | 713             |
|                                                                                                                             |                     | M 2   | 2.0       | 0.40      | 30                                         | 4775                      | 1910            | 25                                         | 3980                      | 1592            | 20                                         | 3185                      | 1274            |
| Aluminium corroyé<br>Si < 6%<br>non trempé                                                                                  |                     | M 2.2 | 2.2       | 0.45      | 30                                         | 4340                      | 1953            | 25                                         | 3615                      | 1627            | 20                                         | 2895                      | 1303            |
|                                                                                                                             |                     | M 2.5 | 2.5       | 0.45      | 30                                         | 3820                      | 1719            | 25                                         | 3185                      | 1433            | 20                                         | 2545                      | 1145            |
|                                                                                                                             |                     | M 3   | 3.0       | 0.50      | 30                                         | 3185                      | 1593            | 25                                         | 2655                      | 1328            | 20                                         | 2120                      | 1060            |
|                                                                                                                             |                     | M 4   | 4.0       | 0.70      | 30                                         | 2385                      | 1670            | 25                                         | 1990                      | 1393            | 20                                         | 1590                      | 1113            |
|                                                                                                                             |                     | M 5   | 5.0       | 0.80      | 30                                         | 1910                      | 1528            | 25                                         | 1590                      | 1272            | 20                                         | 1275                      | 1020            |
|                                                                                                                             |                     | M 6   | 6.0       | 1.00      | 30                                         | 1590                      | 1590            | 25                                         | 1325                      | 1325            | 20                                         | 1060                      | 1060            |
|                                                                                                                             |                     | M 8   | 8.0       | 1.25      | 30                                         | 1195                      | 1494            | 25                                         | 995                       | 1244            | 20                                         | 795                       | 994             |
|                                                                                                                             |                     | M10   | 10.0      | 1.50      | 30                                         | 955                       | 1433            | 25                                         | 795                       | 1193            | 20                                         | 635                       | 953             |
|                                                                                                                             |                     | M 2   | 2.0       | 0.40      | 15                                         | 2385                      | 954             | 10                                         | 1590                      | 636             | 10                                         | 1590                      | 636             |
|                                                                                                                             |                     | M 2.2 | 2.2       | 0.45      | 15                                         | 2170                      | 977             | 10                                         | 1445                      | 650             | 10                                         | 1445                      | 650             |
|  Cuivre non-allié                          |                     | M 2.5 | 2.5       | 0.45      | 15                                         | 1910                      | 860             | 10                                         | 1275                      | 574             | 10                                         | 1275                      | 574             |
|                                                                                                                             |                     | M 3   | 3.0       | 0.50      | 15                                         | 1590                      | 795             | 10                                         | 1060                      | 530             | 10                                         | 1060                      | 530             |
|                                                                                                                             |                     | M 4   | 4.0       | 0.70      | 15                                         | 1195                      | 837             | 10                                         | 795                       | 557             | 10                                         | 795                       | 557             |
|                                                                                                                             |                     | M 5   | 5.0       | 0.80      | 15                                         | 955                       | 764             | 10                                         | 635                       | 508             | 10                                         | 635                       | 508             |
|                                                                                                                             |                     | M 6   | 6.0       | 1.00      | 15                                         | 795                       | 795             | 10                                         | 530                       | 530             | 10                                         | 530                       | 530             |
|                                                                                                                             |                     | M 8   | 8.0       | 1.25      | 15                                         | 595                       | 744             | 10                                         | 400                       | 500             | 10                                         | 400                       | 500             |
|                                                                                                                             |                     | M10   | 10.0      | 1.50      | 15                                         | 475                       | 713             | 10                                         | 320                       | 480             | 10                                         | 320                       | 480             |
|                                                                                                                             |                     | M 2   | 2.0       | 0.40      | 15                                         | 2385                      | 954             | 10                                         | 1590                      | 636             | 10                                         | 1590                      | 636             |
|                                                                                                                             |                     | M 2.2 | 2.2       | 0.45      | 15                                         | 2170                      | 977             | 10                                         | 1445                      | 650             | 10                                         | 1445                      | 650             |
|                                                                                                                             |                     | M 2.5 | 2.5       | 0.45      | 15                                         | 1910                      | 860             | 10                                         | 1275                      | 574             | 10                                         | 1275                      | 574             |
|  Non ferrous metal<br>A <sub>s</sub> > 15% |                     | M 3   | 3.0       | 0.50      | 15                                         | 1590                      | 795             | 10                                         | 1060                      | 530             | 10                                         | 1060                      | 530             |
|                                                                                                                             |                     | M 4   | 4.0       | 0.70      | 15                                         | 1195                      | 837             | 10                                         | 795                       | 557             | 10                                         | 795                       | 557             |
|                                                                                                                             |                     | M 5   | 5.0       | 0.80      | 15                                         | 955                       | 764             | 10                                         | 635                       | 508             | 10                                         | 635                       | 508             |
|                                                                                                                             |                     | M 6   | 6.0       | 1.00      | 15                                         | 795                       | 795             | 10                                         | 530                       | 530             | 10                                         | 530                       | 530             |
|                                                                                                                             |                     | M 8   | 8.0       | 1.25      | 15                                         | 595                       | 744             | 10                                         | 400                       | 500             | 10                                         | 400                       | 500             |
|                                                                                                                             |                     | M10   | 10.0      | 1.50      | 15                                         | 475                       | 713             | 10                                         | 320                       | 480             | 10                                         | 320                       | 480             |



Form E

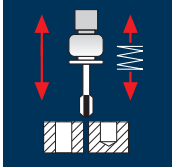


Copper

## CuZn Brass

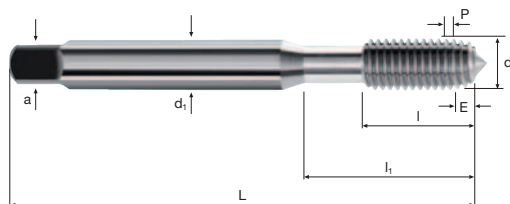
[illegible]

CF

| Application                                                                       | Matières                                                               | M     | ø<br>[mm] | P<br>[mm] | Vc<br>1.5 x d<br>[m·min <sup>-1</sup> ] | n<br>[100%] | v <sub>f</sub><br>[100%] | Vc<br>2.0 x d<br>[m·min <sup>-1</sup> ] | n<br>[100%] | v <sub>f</sub><br>[100%] | Vc<br>3.0 x d<br>[m·min <sup>-1</sup> ] | n<br>[100%] | v <sub>f</sub><br>[100%] |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------|-------|-----------|-----------|-----------------------------------------|-------------|--------------------------|-----------------------------------------|-------------|--------------------------|-----------------------------------------|-------------|--------------------------|
|   | Aciers<br>< 850 N/mm <sup>2</sup><br>A <sub>S</sub> > 10%              | M 2   | 2.0       | 0.40      | 20                                      | 3185        | 1274                     | 15                                      | 2385        | 954                      | 10                                      | 1590        | 636                      |
|                                                                                   |                                                                        | M 2.2 | 2.2       | 0.45      | 20                                      | 2895        | 1303                     | 15                                      | 2170        | 977                      | 10                                      | 1445        | 650                      |
|                                                                                   |                                                                        | M 2.5 | 2.5       | 0.45      | 20                                      | 2545        | 1145                     | 15                                      | 1910        | 860                      | 10                                      | 1275        | 574                      |
|                                                                                   |                                                                        | M 3   | 3.0       | 0.50      | 20                                      | 2120        | 1060                     | 15                                      | 1590        | 795                      | 10                                      | 1060        | 530                      |
|                                                                                   |                                                                        | M 4   | 4.0       | 0.70      | 20                                      | 1590        | 1113                     | 15                                      | 1195        | 837                      | 10                                      | 795         | 557                      |
|                                                                                   |                                                                        | M 5   | 5.0       | 0.80      | 20                                      | 1275        | 1020                     | 15                                      | 955         | 764                      | 10                                      | 635         | 508                      |
|                                                                                   |                                                                        | M 6   | 6.0       | 1.00      | 20                                      | 1060        | 1060                     | 15                                      | 795         | 795                      | 10                                      | 530         | 530                      |
|                                                                                   |                                                                        | M 8   | 8.0       | 1.25      | 20                                      | 795         | 994                      | 15                                      | 595         | 744                      | 10                                      | 400         | 500                      |
|                                                                                   |                                                                        | M10   | 10.0      | 1.50      | 20                                      | 635         | 953                      | 15                                      | 475         | 713                      | 10                                      | 320         | 480                      |
|                                                                                   |                                                                        |       |           |           |                                         |             |                          |                                         |             |                          |                                         |             |                          |
|  | Aciers<br>850 - 1100 N/mm <sup>2</sup><br>A <sub>S</sub> > 10%         | M 2   | 2.0       | 0.40      | 15                                      | 2385        | 954                      | 10                                      | 1590        | 636                      |                                         |             |                          |
|                                                                                   |                                                                        | M 2.2 | 2.2       | 0.45      | 15                                      | 2170        | 977                      | 10                                      | 1445        | 650                      |                                         |             |                          |
|                                                                                   |                                                                        | M 2.5 | 2.5       | 0.45      | 15                                      | 1910        | 860                      | 10                                      | 1275        | 574                      |                                         |             |                          |
|                                                                                   |                                                                        | M 3   | 3.0       | 0.50      | 15                                      | 1590        | 795                      | 10                                      | 1060        | 530                      |                                         |             |                          |
|                                                                                   |                                                                        | M 4   | 4.0       | 0.70      | 15                                      | 1195        | 837                      | 10                                      | 795         | 557                      |                                         |             |                          |
|                                                                                   |                                                                        | M 5   | 5.0       | 0.80      | 15                                      | 955         | 764                      | 10                                      | 635         | 508                      |                                         |             |                          |
|                                                                                   |                                                                        | M 6   | 6.0       | 1.00      | 15                                      | 795         | 795                      | 10                                      | 530         | 530                      |                                         |             |                          |
|                                                                                   |                                                                        | M 8   | 8.0       | 1.25      | 15                                      | 595         | 744                      | 10                                      | 400         | 500                      |                                         |             |                          |
|                                                                                   |                                                                        | M10   | 10.0      | 1.50      | 15                                      | 475         | 713                      | 10                                      | 320         | 480                      |                                         |             |                          |
|                                                                                   |                                                                        |       |           |           |                                         |             |                          |                                         |             |                          |                                         |             |                          |
|  | Aciers inoxydables<br>ferritique/martensitique<br>A <sub>S</sub> > 10% | M 2   | 2.0       | 0.40      | 15                                      | 2385        | 954                      | 10                                      | 1590        | 636                      |                                         |             |                          |
|                                                                                   |                                                                        | M 2.2 | 2.2       | 0.45      | 15                                      | 2170        | 977                      | 10                                      | 1445        | 650                      |                                         |             |                          |
|                                                                                   |                                                                        | M 2.5 | 2.5       | 0.45      | 15                                      | 1910        | 860                      | 10                                      | 1275        | 574                      |                                         |             |                          |
|                                                                                   |                                                                        | M 3   | 3.0       | 0.50      | 15                                      | 1590        | 795                      | 10                                      | 1060        | 530                      |                                         |             |                          |
|                                                                                   |                                                                        | M 4   | 4.0       | 0.70      | 15                                      | 1195        | 837                      | 10                                      | 795         | 557                      |                                         |             |                          |
|                                                                                   |                                                                        | M 5   | 5.0       | 0.80      | 15                                      | 955         | 764                      | 10                                      | 635         | 508                      |                                         |             |                          |
|                                                                                   |                                                                        | M 6   | 6.0       | 1.00      | 15                                      | 795         | 795                      | 10                                      | 530         | 530                      |                                         |             |                          |
|                                                                                   |                                                                        | M 8   | 8.0       | 1.25      | 15                                      | 595         | 744                      | 10                                      | 400         | 500                      |                                         |             |                          |
|                                                                                   |                                                                        | M10   | 10.0      | 1.50      | 15                                      | 475         | 713                      | 10                                      | 320         | 480                      |                                         |             |                          |
|                                                                                   |                                                                        |       |           |           |                                         |             |                          |                                         |             |                          |                                         |             |                          |
|  | Aciers inoxydables<br>[Cr-Ni/1.4301]                                   | M 2   | 2.0       | 0.40      | 15                                      | 2385        | 954                      | 10                                      | 1590        | 636                      |                                         |             |                          |
|                                                                                   |                                                                        | M 2.2 | 2.2       | 0.45      | 15                                      | 2170        | 977                      | 10                                      | 1445        | 650                      |                                         |             |                          |
|                                                                                   |                                                                        | M 2.5 | 2.5       | 0.45      | 15                                      | 1910        | 860                      | 10                                      | 1275        | 574                      |                                         |             |                          |
|                                                                                   |                                                                        | M 3   | 3.0       | 0.50      | 15                                      | 1590        | 795                      | 10                                      | 1060        | 530                      |                                         |             |                          |
|                                                                                   |                                                                        | M 4   | 4.0       | 0.70      | 15                                      | 1195        | 837                      | 10                                      | 795         | 557                      |                                         |             |                          |
|                                                                                   |                                                                        | M 5   | 5.0       | 0.80      | 15                                      | 955         | 764                      | 10                                      | 635         | 508                      |                                         |             |                          |
|                                                                                   |                                                                        | M 6   | 6.0       | 1.00      | 15                                      | 795         | 795                      | 10                                      | 530         | 530                      |                                         |             |                          |
|                                                                                   |                                                                        | M 8   | 8.0       | 1.25      | 15                                      | 595         | 744                      | 10                                      | 400         | 500                      |                                         |             |                          |
|                                                                                   |                                                                        | M10   | 10.0      | 1.50      | 15                                      | 475         | 713                      | 10                                      | 320         | 480                      |                                         |             |                          |
|                                                                                   |                                                                        |       |           |           |                                         |             |                          |                                         |             |                          |                                         |             |                          |

St

## 7G



< 850

850-1100

## Stainless

[illegible]

CF



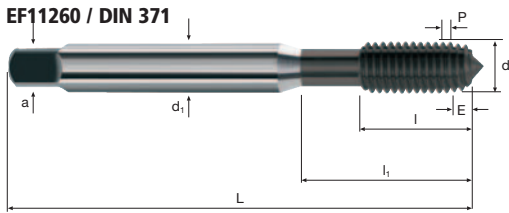


MF

ISO 2  
(6H)

HSS  
PM/F

Form E



Al  
Aluminium  
> 99%

Al  
Aluminium  
Alloy

Cu  
Copper

CuZn Brass

| Exemple: N° cde     |     |      |     |    |                |                |     |   |      | F-DLC   |   |
|---------------------|-----|------|-----|----|----------------|----------------|-----|---|------|---------|---|
| N° d'article Code-ø |     |      |     |    |                |                |     |   |      | EF11260 |   |
| ø Code              | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   |      |         |   |
| .046                | M 4 | 0.50 | 63  | 13 | 21             | 4.5            | 3.4 | 3 | 3.80 |         | ● |
| .048                | M 5 | 0.50 | 70  | 15 | 25             | 6.0            | 4.9 | 4 | 4.80 |         | ● |
| .050                | M 6 | 0.50 | 80  | 17 | 30             | 6.0            | 4.9 | 4 | 5.80 |         | ● |
| .064                | M 6 | 0.75 | 80  | 17 | 30             | 6.0            | 4.9 | 4 | 5.65 |         | ● |
| .066                | M 8 | 0.75 | 90  | 20 | 35             | 8.0            | 6.2 | 4 | 7.65 |         | ● |
| .068                | M10 | 0.75 | 100 | 22 | 39             | 10.0           | 8.0 | 4 | 9.65 |         | ● |
| .090                | M 8 | 1.00 | 90  | 20 | 35             | 8.0            | 6.2 | 4 | 7.55 |         | ● |
| .092                | M10 | 1.00 | 100 | 22 | 39             | 10.0           | 8.0 | 4 | 9.55 |         | ● |
| .162                | M10 | 1.25 | 100 | 22 | 39             | 10.0           | 8.0 | 4 | 9.40 |         | ● |

| Exemple: N° cde     |     |      |     |    |                |                |      |   |       | F-DLC   |   |
|---------------------|-----|------|-----|----|----------------|----------------|------|---|-------|---------|---|
| N° d'article Code-ø |     |      |     |    |                |                |      |   |       | EF11261 |   |
| ø Code              | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a    |   |       |         |   |
| .094                | M12 | 1.00 | 100 | 18 | 39             | 9.0            | 7.0  | 5 | 11.50 |         | ● |
| .096                | M14 | 1.00 | 100 | 18 | 39             | 11.0           | 9.0  | 5 | 13.50 |         | ● |
| .098                | M16 | 1.00 | 100 | 18 | 39             | 12.0           | 9.0  | 5 | 15.50 |         | ● |
| .164                | M12 | 1.25 | 100 | 22 | 39             | 9.0            | 7.0  | 5 | 11.40 |         | ● |
| .176                | M12 | 1.50 | 100 | 22 | 39             | 9.0            | 7.0  | 5 | 11.30 |         | ● |
| .178                | M14 | 1.50 | 100 | 22 | 39             | 11.0           | 9.0  | 5 | 13.30 |         | ● |
| .182                | M16 | 1.50 | 100 | 22 | 39             | 12.0           | 9.0  | 5 | 15.30 |         | ● |
| .184                | M20 | 1.50 | 125 | 26 | 50             | 16.0           | 12.0 | 6 | 19.30 |         | ● |

CF





Tarauds à refouler

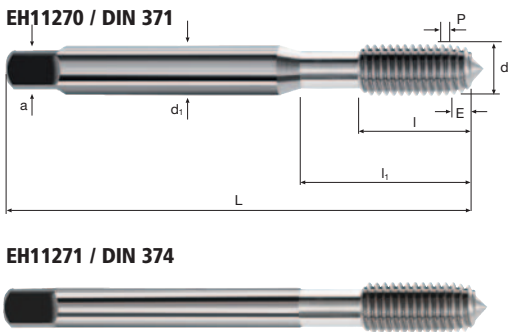


MF

ISO 2  
(6H)

HSS  
PM/F

Form E



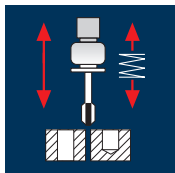
|             |                |  |  |  |  |  |  |                   |  |  |
|-------------|----------------|--|--|--|--|--|--|-------------------|--|--|
| Rm<br>< 850 | Rm<br>850-1100 |  |  |  |  |  |  | Inox<br>Stainless |  |  |
|-------------|----------------|--|--|--|--|--|--|-------------------|--|--|

| Exemple: N° cde      N° d'article      Code-ø<br><b>EH11270</b> <b>.046</b> |     |      |     |    |                |                |     |   |      |  | TiCN           |
|-----------------------------------------------------------------------------|-----|------|-----|----|----------------|----------------|-----|---|------|--|----------------|
|                                                                             |     |      |     |    |                |                |     |   |      |  | <b>EH11270</b> |
| Ø<br>Code                                                                   | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   |      |  |                |
| .046                                                                        | M 4 | 0.50 | 63  | 13 | 21             | 4.5            | 2.1 | 4 | 3.80 |  | ●              |
| .048                                                                        | M 5 | 0.50 | 70  | 15 | 25             | 6.0            | 2.7 | 4 | 4.80 |  | ●              |
| .050                                                                        | M 6 | 0.50 | 80  | 17 | 30             | 6.0            | 3.4 | 4 | 5.80 |  | ●              |
| .064                                                                        | M 6 | 0.75 | 80  | 17 | 30             | 6.0            | 3.4 | 4 | 5.65 |  | ●              |
| .066                                                                        | M 8 | 0.75 | 90  | 20 | 35             | 8.0            | 4.9 | 5 | 7.65 |  | ●              |
| .068                                                                        | M10 | 0.75 | 100 | 22 | 39             | 10.0           | 5.5 | 5 | 9.65 |  | ●              |
| .090                                                                        | M 8 | 1.00 | 90  | 20 | 35             | 8.0            | 4.9 | 5 | 7.55 |  | ●              |
| .092                                                                        | M10 | 1.00 | 100 | 22 | 39             | 10.0           | 5.5 | 5 | 9.55 |  | ●              |
| .162                                                                        | M10 | 1.25 | 100 | 22 | 39             | 10.0           | 5.5 | 5 | 9.40 |  | ●              |

| Exemple: N° cde      N° d'article      Code-ø<br><b>EH11271</b> <b>.094</b> |     |      |     |    |                |                |      |   |       |  | TiCN           |
|-----------------------------------------------------------------------------|-----|------|-----|----|----------------|----------------|------|---|-------|--|----------------|
|                                                                             |     |      |     |    |                |                |      |   |       |  | <b>EH11271</b> |
| Ø<br>Code                                                                   | d   | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a    |   |       |  |                |
| .094                                                                        | M12 | 1.00 | 100 | 18 | 39             | 9.0            | 7.0  | 7 | 11.50 |  | ●              |
| .096                                                                        | M14 | 1.00 | 100 | 18 | 39             | 11.0           | 9.0  | 7 | 13.50 |  | ●              |
| .098                                                                        | M16 | 1.00 | 100 | 18 | 39             | 12.0           | 9.0  | 7 | 15.50 |  | ●              |
| .164                                                                        | M12 | 1.25 | 100 | 22 | 39             | 9.0            | 7.0  | 7 | 11.40 |  | ●              |
| .176                                                                        | M12 | 1.50 | 100 | 22 | 39             | 9.0            | 7.0  | 7 | 11.30 |  | ●              |
| .178                                                                        | M14 | 1.50 | 100 | 22 | 39             | 11.0           | 9.0  | 7 | 13.30 |  | ●              |
| .180                                                                        | M16 | 1.50 | 100 | 22 | 39             | 12.0           | 9.0  | 7 | 15.30 |  | ●              |
| .184                                                                        | M20 | 1.50 | 125 | 26 | 50             | 16.0           | 12.0 | 7 | 19.30 |  | ●              |

CF

## Application



## Matières

### Aluminium non-allié

| EG-M   | ø<br>[mm] | P<br>[mm] | V <sub>c</sub><br>1.5 x d<br>[min <sup>-1</sup> ] |                |        | V <sub>c</sub><br>2.0 x d<br>[min <sup>-1</sup> ] |                |        | V <sub>c</sub><br>3.0 x d<br>[min <sup>-1</sup> ] |                |        |
|--------|-----------|-----------|---------------------------------------------------|----------------|--------|---------------------------------------------------|----------------|--------|---------------------------------------------------|----------------|--------|
|        |           |           | n                                                 | v <sub>f</sub> | [100%] | n                                                 | v <sub>f</sub> | [100%] | n                                                 | v <sub>f</sub> | [100%] |
| EGM 3  | 3.650     | 0.50      | 25                                                | 2180           | 1090   | 20                                                | 1745           | 873    | 15                                                | 1310           | 655    |
| EGM 4  | 4.910     | 0.70      | 25                                                | 1620           | 1134   | 20                                                | 1295           | 906    | 15                                                | 970            | 679    |
| EGM 5  | 6.040     | 0.80      | 25                                                | 1320           | 1056   | 20                                                | 1055           | 844    | 15                                                | 790            | 632    |
| EGM 6  | 7.300     | 1.00      | 25                                                | 1090           | 1090   | 20                                                | 870            | 870    | 15                                                | 655            | 655    |
| EGM 8  | 9.624     | 1.25      | 25                                                | 825            | 1031   | 20                                                | 660            | 825    | 15                                                | 495            | 619    |
| EGM 10 | 11.948    | 1.50      | 25                                                | 665            | 998    | 20                                                | 535            | 803    | 15                                                | 400            | 600    |
| EGM 12 | 14.274    | 1.75      | 25                                                | 555            | 971    | 20                                                | 445            | 779    | 15                                                | 335            | 586    |

### Aluminium corroyé Si < 6% non trempé

|        |        |      |    |      |      |    |      |      |    |      |     |
|--------|--------|------|----|------|------|----|------|------|----|------|-----|
| EGM 3  | 3.650  | 0.50 | 30 | 2615 | 1308 | 25 | 2180 | 1090 | 20 | 1745 | 873 |
| EGM 4  | 4.910  | 0.70 | 30 | 1945 | 1362 | 25 | 1620 | 1134 | 20 | 1295 | 906 |
| EGM 5  | 6.040  | 0.80 | 30 | 1580 | 1264 | 25 | 1320 | 1056 | 20 | 1055 | 844 |
| EGM 6  | 7.300  | 1.00 | 30 | 1310 | 1310 | 25 | 1090 | 1090 | 20 | 870  | 870 |
| EGM 8  | 9.624  | 1.25 | 30 | 990  | 1238 | 25 | 825  | 1031 | 20 | 660  | 825 |
| EGM 10 | 11.948 | 1.50 | 30 | 800  | 1200 | 25 | 665  | 998  | 20 | 535  | 803 |
| EGM 12 | 14.274 | 1.75 | 30 | 670  | 1173 | 25 | 555  | 971  | 20 | 445  | 779 |

### Cuivre non-allié



|        |        |      |    |      |     |    |     |     |    |     |     |
|--------|--------|------|----|------|-----|----|-----|-----|----|-----|-----|
| EGM 3  | 3.650  | 0.50 | 15 | 1310 | 655 | 10 | 870 | 435 | 10 | 870 | 435 |
| EGM 4  | 4.910  | 0.70 | 15 | 970  | 679 | 10 | 650 | 455 | 10 | 650 | 455 |
| EGM 5  | 6.040  | 0.80 | 15 | 790  | 632 | 10 | 525 | 420 | 10 | 525 | 420 |
| EGM 6  | 7.300  | 1.00 | 15 | 655  | 655 | 10 | 435 | 435 | 10 | 435 | 435 |
| EGM 8  | 9.624  | 1.25 | 15 | 495  | 619 | 10 | 330 | 413 | 10 | 330 | 413 |
| EGM 10 | 11.948 | 1.50 | 15 | 400  | 600 | 10 | 265 | 398 | 10 | 265 | 398 |
| EGM 12 | 14.274 | 1.75 | 15 | 335  | 586 | 10 | 225 | 394 | 10 | 225 | 394 |

### Métaux non ferreux A<sub>s</sub> > 15%



|        |        |      |    |      |     |    |     |     |    |     |     |
|--------|--------|------|----|------|-----|----|-----|-----|----|-----|-----|
| EGM 3  | 3.650  | 0.50 | 15 | 1310 | 655 | 10 | 870 | 435 | 10 | 870 | 435 |
| EGM 4  | 4.910  | 0.70 | 15 | 970  | 679 | 10 | 650 | 455 | 10 | 650 | 455 |
| EGM 5  | 6.040  | 0.80 | 15 | 790  | 632 | 10 | 525 | 420 | 10 | 525 | 420 |
| EGM 6  | 7.300  | 1.00 | 15 | 655  | 655 | 10 | 435 | 435 | 10 | 435 | 435 |
| EGM 8  | 9.624  | 1.25 | 15 | 495  | 619 | 10 | 330 | 413 | 10 | 330 | 413 |
| EGM 10 | 11.948 | 1.50 | 15 | 400  | 600 | 10 | 265 | 398 | 10 | 265 | 398 |
| EGM 12 | 14.274 | 1.75 | 15 | 335  | 586 | 10 | 225 | 394 | 10 | 225 | 394 |

Tarauds à refouler pour filets rapportés

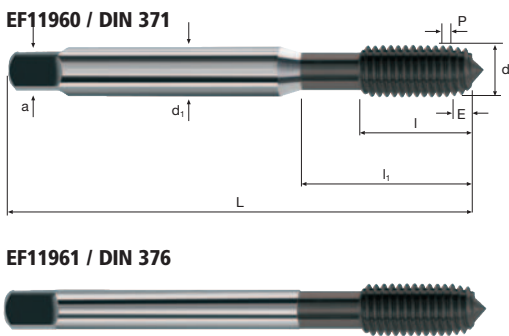


EG M

6H mod

HSS PM/F

Form E



Al  
Aluminium  
> 99%

Al  
Aluminium  
Alloy

Cu  
Copper

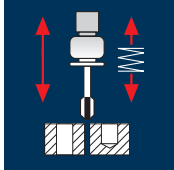
CuZn Brass

| Exemple: N° cde     |       |      |     |    |                |                |     |   |      | F-DLC   |   |
|---------------------|-------|------|-----|----|----------------|----------------|-----|---|------|---------|---|
| N° d'article Code-ø |       |      |     |    |                |                |     |   |      | EF11960 |   |
| ø Code              | d     | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   |      |         |   |
| .044                | EGM 3 | 0.50 | 63  | 13 | 21             | 4.5            | 3.4 | 3 | 3.40 |         | ● |
| .058                | EGM 4 | 0.70 | 70  | 15 | 25             | 6.0            | 4.9 | 4 | 4.60 |         | ● |
| .084                | EGM 5 | 0.80 | 80  | 17 | 30             | 6.0            | 4.9 | 4 | 5.70 |         | ● |
| .088                | EGM 6 | 1.00 | 90  | 20 | 35             | 8.0            | 6.2 | 4 | 6.80 |         | ● |
| .160                | EGM 8 | 1.25 | 100 | 22 | 39             | 10.0           | 8.0 | 4 | 9.00 |         | ● |
|                     |       |      |     |    |                |                |     |   |      |         |   |
|                     |       |      |     |    |                |                |     |   |      |         |   |
|                     |       |      |     |    |                |                |     |   |      |         |   |
|                     |       |      |     |    |                |                |     |   |      |         |   |

| Exemple: N° cde     |       |      |     |    |                |                |     |   |       | F-DLC   |   |
|---------------------|-------|------|-----|----|----------------|----------------|-----|---|-------|---------|---|
| N° d'article Code-ø |       |      |     |    |                |                |     |   |       | EF11961 |   |
| ø Code              | d     | P    | L   | l  | l <sub>1</sub> | d <sub>1</sub> | a   |   |       |         |   |
| .174                | EGM10 | 1.50 | 110 | 25 | 50             | 9.0            | 7.0 | 5 | 11.20 |         | ● |
| .240                | EGM12 | 1.75 | 110 | 26 | 58             | 11.0           | 9.0 | 5 | 13.40 |         | ● |
|                     |       |      |     |    |                |                |     |   |       |         |   |
|                     |       |      |     |    |                |                |     |   |       |         |   |
|                     |       |      |     |    |                |                |     |   |       |         |   |
|                     |       |      |     |    |                |                |     |   |       |         |   |
|                     |       |      |     |    |                |                |     |   |       |         |   |
|                     |       |      |     |    |                |                |     |   |       |         |   |

CF

## Application



## Matières

Aciers  
< 850 N/mm<sup>2</sup>  
A<sub>S</sub> > 10%



Aciers inoxydables  
ferritique/martensitique  
A<sub>S</sub> > 10%



Aciers inoxydables  
[Cr-Ni/1.4301]



| EGM-M  | ø<br>[mm] | P<br>[mm] | V <sub>c</sub> 1.5 x d    |                          |     | V <sub>c</sub> 2.0 x d    |                          |     | V <sub>c</sub> 3.0 x d    |                          |     |
|--------|-----------|-----------|---------------------------|--------------------------|-----|---------------------------|--------------------------|-----|---------------------------|--------------------------|-----|
|        |           |           | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] |     | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] |     | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[100%] |     |
| EGM 3  | 3.650     | 0.50      | 20                        | 1745                     | 873 | 15                        | 1310                     | 655 | 10                        | 870                      | 435 |
| EGM 4  | 4.910     | 0.70      | 20                        | 1295                     | 906 | 15                        | 970                      | 679 | 10                        | 650                      | 455 |
| EGM 5  | 6.040     | 0.80      | 20                        | 1055                     | 844 | 15                        | 790                      | 632 | 10                        | 525                      | 420 |
| EGM 6  | 7.300     | 1.00      | 20                        | 870                      | 870 | 15                        | 655                      | 655 | 10                        | 435                      | 435 |
| EGM 8  | 9.624     | 1.25      | 20                        | 660                      | 825 | 15                        | 495                      | 619 | 10                        | 330                      | 413 |
| EGM 10 | 11.948    | 1.50      | 20                        | 535                      | 803 | 15                        | 400                      | 600 | 10                        | 265                      | 398 |
| EGM 12 | 14.274    | 1.75      | 20                        | 445                      | 779 | 15                        | 335                      | 586 | 10                        | 225                      | 394 |
|        |           |           |                           |                          |     |                           |                          |     |                           |                          |     |
| EGM 3  | 3.650     | 0.50      | 15                        | 1310                     | 655 | 10                        | 870                      | 435 |                           |                          |     |
| EGM 4  | 4.910     | 0.70      | 15                        | 970                      | 679 | 10                        | 650                      | 455 |                           |                          |     |
| EGM 5  | 6.040     | 0.80      | 15                        | 790                      | 632 | 10                        | 525                      | 420 |                           |                          |     |
| EGM 6  | 7.300     | 1.00      | 15                        | 655                      | 655 | 10                        | 435                      | 435 |                           |                          |     |
| EGM 8  | 9.624     | 1.25      | 15                        | 495                      | 619 | 10                        | 330                      | 413 |                           |                          |     |
| EGM 10 | 11.948    | 1.50      | 15                        | 400                      | 600 | 10                        | 265                      | 398 |                           |                          |     |
| EGM 12 | 14.274    | 1.75      | 15                        | 335                      | 586 | 10                        | 225                      | 394 |                           |                          |     |
|        |           |           |                           |                          |     |                           |                          |     |                           |                          |     |
| EGM 3  | 3.650     | 0.50      | 15                        | 1310                     | 655 | 10                        | 870                      | 435 |                           |                          |     |
| EGM 4  | 4.910     | 0.70      | 15                        | 970                      | 679 | 10                        | 650                      | 455 |                           |                          |     |
| EGM 5  | 6.040     | 0.80      | 15                        | 790                      | 632 | 10                        | 525                      | 420 |                           |                          |     |
| EGM 6  | 7.300     | 1.00      | 15                        | 655                      | 655 | 10                        | 435                      | 435 |                           |                          |     |
| EGM 8  | 9.624     | 1.25      | 15                        | 495                      | 619 | 10                        | 330                      | 413 |                           |                          |     |
| EGM 10 | 11.948    | 1.50      | 15                        | 400                      | 600 | 10                        | 265                      | 398 |                           |                          |     |
| EGM 12 | 14.274    | 1.75      | 15                        | 335                      | 586 | 10                        | 225                      | 394 |                           |                          |     |
|        |           |           |                           |                          |     |                           |                          |     |                           |                          |     |
| EGM 3  | 3.650     | 0.50      | 15                        | 1310                     | 655 | 10                        | 870                      | 435 |                           |                          |     |
| EGM 4  | 4.910     | 0.70      | 15                        | 970                      | 679 | 10                        | 650                      | 455 |                           |                          |     |
| EGM 5  | 6.040     | 0.80      | 15                        | 790                      | 632 | 10                        | 525                      | 420 |                           |                          |     |
| EGM 6  | 7.300     | 1.00      | 15                        | 655                      | 655 | 10                        | 435                      | 435 |                           |                          |     |
| EGM 8  | 9.624     | 1.25      | 15                        | 495                      | 619 | 10                        | 330                      | 413 |                           |                          |     |
| EGM 10 | 11.948    | 1.50      | 15                        | 400                      | 600 | 10                        | 265                      | 398 |                           |                          |     |
| EGM 12 | 14.274    | 1.75      | 15                        | 335                      | 586 | 10                        | 225                      | 394 |                           |                          |     |
|        |           |           |                           |                          |     |                           |                          |     |                           |                          |     |

Tarauds à refouler pour filets rapportés

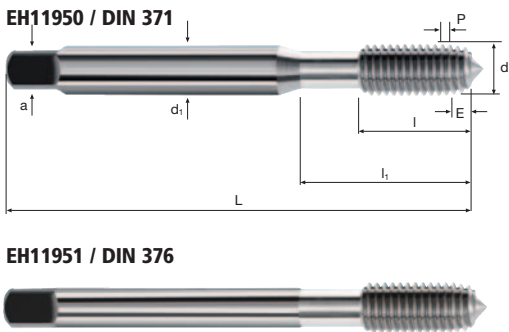


EG M

6H mod

HSS PM/F

Form E



|          |             |  |  |  |  |  |                |  |  |
|----------|-------------|--|--|--|--|--|----------------|--|--|
| Rm < 850 | Rm 850-1100 |  |  |  |  |  | Inox Stainless |  |  |
|----------|-------------|--|--|--|--|--|----------------|--|--|

| Exemple: N° cde <b>EH11950</b> N° d'article <b>.044</b> |       |      |     |    |    |      |     |   |      | TiCN    |
|---------------------------------------------------------|-------|------|-----|----|----|------|-----|---|------|---------|
| Ø Code                                                  | d     | P    | L   | l  | l1 | d1   | a   |   |      | EH11950 |
| .044                                                    | EGM 3 | 0.50 | 63  | 13 | 21 | 4.5  | 3.4 | 3 | 3.40 | ●       |
| .058                                                    | EGM 4 | 0.70 | 70  | 15 | 25 | 6.0  | 4.9 | 4 | 4.60 | ●       |
| .084                                                    | EGM 5 | 0.80 | 80  | 17 | 30 | 6.0  | 4.9 | 5 | 5.70 | ●       |
| .088                                                    | EGM 6 | 1.00 | 90  | 20 | 35 | 8.0  | 6.2 | 5 | 6.80 | ●       |
| .160                                                    | EGM 8 | 1.25 | 100 | 22 | 39 | 10.0 | 8.0 | 5 | 9.00 | ●       |
|                                                         |       |      |     |    |    |      |     |   |      |         |
|                                                         |       |      |     |    |    |      |     |   |      |         |
|                                                         |       |      |     |    |    |      |     |   |      |         |
|                                                         |       |      |     |    |    |      |     |   |      |         |

| Exemple: N° cde <b>EH11951</b> N° d'article <b>.174</b> |       |      |     |    |    |      |     |   |       | TiCN    |
|---------------------------------------------------------|-------|------|-----|----|----|------|-----|---|-------|---------|
| Ø Code                                                  | d     | P    | L   | l  | l1 | d1   | a   |   |       | EH11951 |
| .174                                                    | EGM10 | 1.50 | 110 | 25 | 40 | 9.0  | 7.0 | 7 | 11.20 | ●       |
| .240                                                    | EGM12 | 1.75 | 110 | 28 | 40 | 11.0 | 9.0 | 7 | 13.40 | ●       |
|                                                         |       |      |     |    |    |      |     |   |       |         |
|                                                         |       |      |     |    |    |      |     |   |       |         |
|                                                         |       |      |     |    |    |      |     |   |       |         |
|                                                         |       |      |     |    |    |      |     |   |       |         |
|                                                         |       |      |     |    |    |      |     |   |       |         |
|                                                         |       |      |     |    |    |      |     |   |       |         |

CF



# Fraises à fileter M / MF / G / UNC / UNF / UN / NPT / NPTF

## Fraises à percer-tarauder avec chanfrein à 45°

N° E22200



N° E22300



|   |       |  |                         |                    |     |
|---|-------|--|-------------------------|--------------------|-----|
| M | 1.5xd |  | Al<br>Aluminium<br>Cast | GG(G)<br>Cast iron | 391 |
| M | 2xd   |  | Al<br>Aluminium<br>Cast | GG(G)<br>Cast iron | 393 |

## Fraises à fileter avec chanfrein à 45°

N° EH24200



N° EH24300



N° EH24220



N° EH24320



N° EH24340



N° EH24360



N° EH24370



|     |       |  |                 |                    |     |
|-----|-------|--|-----------------|--------------------|-----|
| M   | 1.5xd |  | HRC<br>< 56     | GG(G)<br>Cast iron | 395 |
| M   | 2xd   |  | Rm<br><850-1500 | GG(G)<br>Cast iron | 397 |
| MF  | 1.5xd |  | Rm<br><850-1500 | GG(G)<br>Cast iron | 399 |
| MF  | 2xd   |  | Rm<br><850-1500 | GG(G)<br>Cast iron | 401 |
| G   | 2xd   |  | Rm<br><850-1500 | GG(G)<br>Cast iron | 403 |
| UNC | 2xd   |  | Rm<br><850-1500 | GG(G)<br>Cast iron | 405 |
| UNF | 2xd   |  | Rm<br><850-1500 | GG(G)<br>Cast iron | 407 |

TM





# Fraises à fileter M / MF / G / UNC / UNF / UN / NPT / NPTF

## Fraises à fileter

N° EU2010



M

1.5xd



Rm

<850-1500

GG(G)

Cast iron

409

N° EU2060



G

1.5xd



Rm

<850-1300

GG(G)

Cast iron

411

N° EU2110



UN

1.5xd



Rm

<850-1300

GG(G)

Cast iron

413

N° EU2200 / EU2210



NPT  
NPTF



Rm

<850-1300

GG(G)

Cast iron

415

## Fraises à fileter pour taraudage multiple

N° EH26020



M



Rm

<850-1500

GG(G)

Cast iron

417

N° EH26040



G



Rm

<850-1500

GG(G)

Cast iron

419

## Fraises à tourbillonner

N° E28500



M

3xd



Rm

<850-1500

Inox  
Ti  
Ni

421

TM

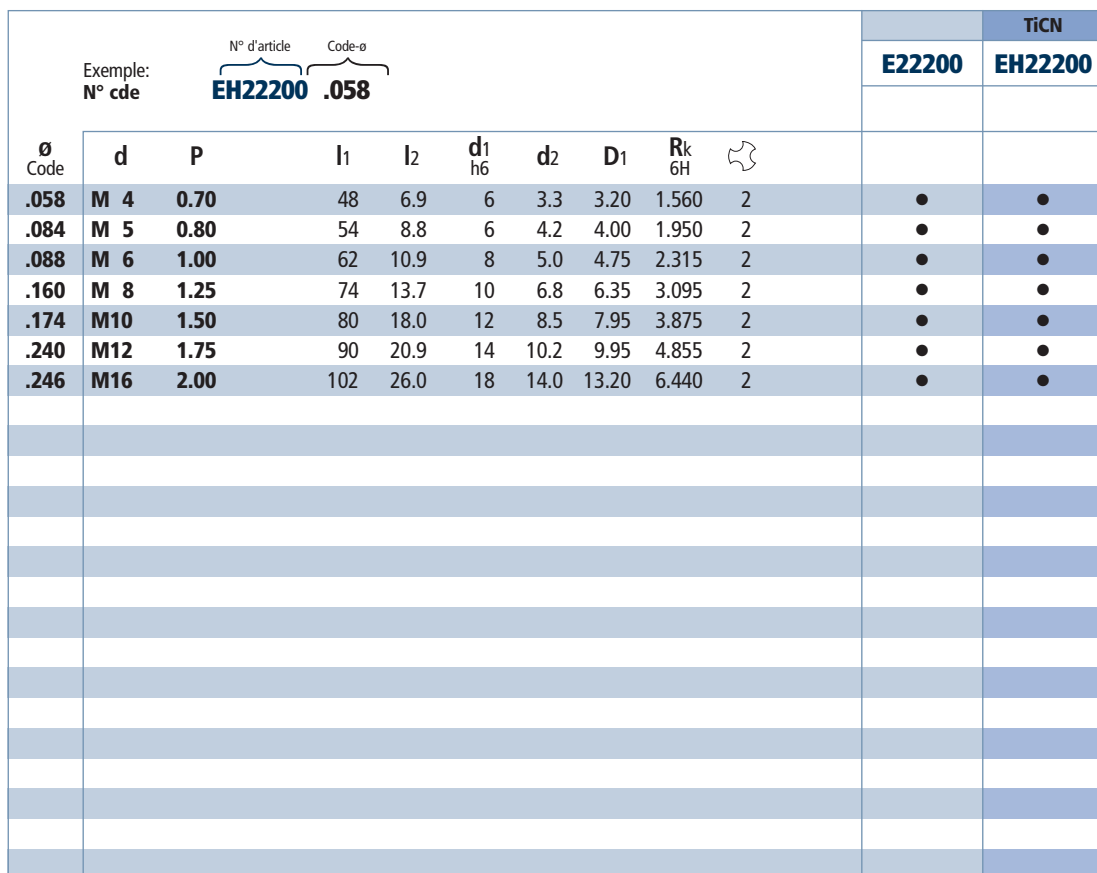
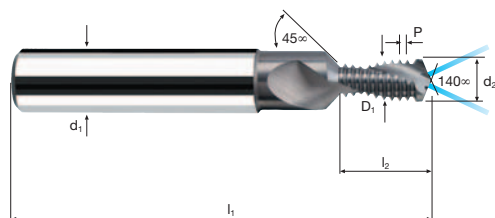
| Application | Matières                           | M   | d <sub>2</sub><br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | L <sub>K</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] |
|-------------|------------------------------------|-----|------------------------|---------------------------|-----------|------------------------|---------------------------|----------------------------|
|             | Fonte<br>GG(G)                     | M 4 | 3.30                   | 100                       | 0.050     | 7.4                    | 9645                      | 480                        |
|             |                                    | M 5 | 4.20                   | 100                       | 0.065     | 9.4                    | 7580                      | 495                        |
|             |                                    | M 6 | 5.00                   | 100                       | 0.075     | 11.7                   | 6365                      | 475                        |
|             |                                    | M 8 | 6.80                   | 100                       | 0.100     | 14.7                   | 4680                      | 470                        |
|             |                                    | M10 | 8.50                   | 100                       | 0.125     | 19.3                   | 3745                      | 470                        |
|             |                                    | M12 | 10.20                  | 100                       | 0.150     | 22.2                   | 3120                      | 470                        |
|             |                                    | M16 | 14.00                  | 100                       | 0.210     | 27.8                   | 2275                      | 480                        |
|             | Fonte d'aluminium                  | M 4 | 3.30                   | 250                       | 0.060     | 7.4                    | 24115                     | 1445                       |
|             |                                    | M 5 | 4.20                   | 250                       | 0.075     | 9.4                    | 18950                     | 1420                       |
|             |                                    | M 6 | 5.00                   | 250                       | 0.090     | 11.7                   | 15915                     | 1430                       |
|             |                                    | M 8 | 6.80                   | 250                       | 0.120     | 14.7                   | 11705                     | 1405                       |
|             |                                    | M10 | 8.50                   | 250                       | 0.150     | 19.3                   | 9360                      | 1405                       |
|             |                                    | M12 | 10.20                  | 250                       | 0.180     | 22.2                   | 7800                      | 1405                       |
|             |                                    | M16 | 14.00                  | 250                       | 0.250     | 27.8                   | 5685                      | 1420                       |
|             | Aluminium corroyé<br>Si < 6%       | M 4 | 3.30                   | 200                       | 0.060     | 7.4                    | 19290                     | 1155                       |
|             |                                    | M 5 | 4.20                   | 200                       | 0.075     | 9.4                    | 15160                     | 1135                       |
|             |                                    | M 6 | 5.00                   | 200                       | 0.090     | 11.7                   | 12735                     | 1145                       |
|             |                                    | M 8 | 6.80                   | 200                       | 0.120     | 14.7                   | 9360                      | 1125                       |
|             |                                    | M10 | 8.50                   | 200                       | 0.150     | 19.3                   | 7490                      | 1125                       |
|             |                                    | M12 | 10.20                  | 200                       | 0.180     | 22.2                   | 6240                      | 1125                       |
|             |                                    | M16 | 14.00                  | 200                       | 0.250     | 27.8                   | 4545                      | 1135                       |
|             | Recommandation:<br>sans revêtement |     |                        |                           |           |                        |                           |                            |
|             | Laiton à copeaux courts<br>CuZn    | M 4 | 3.30                   | 250                       | 0.060     | 7.4                    | 24115                     | 1445                       |
|             |                                    | M 5 | 4.20                   | 250                       | 0.075     | 9.4                    | 18950                     | 1420                       |
|             |                                    | M 6 | 5.00                   | 250                       | 0.090     | 11.7                   | 15915                     | 1430                       |
|             |                                    | M 8 | 6.80                   | 250                       | 0.120     | 14.7                   | 11705                     | 1405                       |
|             |                                    | M10 | 8.50                   | 250                       | 0.150     | 19.3                   | 9360                      | 1405                       |
|             |                                    | M12 | 10.20                  | 250                       | 0.180     | 22.2                   | 7800                      | 1405                       |
|             |                                    | M16 | 14.00                  | 250                       | 0.250     | 27.8                   | 5685                      | 1420                       |

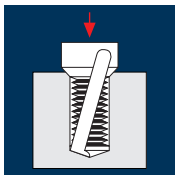
Données de coupe pour outils à revêtement TiCN

| Application | Matières                           | M   | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>fc</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|-------------|------------------------------------|-----|------------|-----------|---|---------------------------|------------------------|--------------------------|-----------------------------|----------------------------|
|             | Fonte<br>GG(G)                     | M 4 | 3.20       | 0.70      | 2 | 100                       | 0.025                  | 9945                     | 99                          | 495                        |
|             |                                    | M 5 | 4.00       | 0.80      | 2 | 100                       | 0.030                  | 7960                     | 96                          | 480                        |
|             |                                    | M 6 | 4.75       | 1.00      | 2 | 100                       | 0.035                  | 6700                     | 98                          | 470                        |
|             |                                    | M 8 | 6.35       | 1.25      | 2 | 100                       | 0.050                  | 5015                     | 103                         | 500                        |
|             |                                    | M10 | 7.95       | 1.50      | 2 | 100                       | 0.060                  | 4005                     | 98                          | 480                        |
|             |                                    | M12 | 9.95       | 1.75      | 2 | 100                       | 0.075                  | 3200                     | 82                          | 480                        |
|             |                                    | M16 | 13.20      | 2.00      | 2 | 100                       | 0.100                  | 2410                     | 84                          | 480                        |
|             | Fonte d'aluminium                  | M 4 | 3.20       | 0.70      | 2 | 250                       | 0.030                  | 24870                    | 298                         | 1490                       |
|             |                                    | M 5 | 4.00       | 0.80      | 2 | 250                       | 0.035                  | 19895                    | 279                         | 1395                       |
|             |                                    | M 6 | 4.75       | 1.00      | 2 | 250                       | 0.045                  | 16755                    | 315                         | 1510                       |
|             |                                    | M 8 | 6.35       | 1.25      | 2 | 250                       | 0.060                  | 12530                    | 310                         | 1505                       |
|             |                                    | M10 | 7.95       | 1.50      | 2 | 250                       | 0.070                  | 10010                    | 287                         | 1400                       |
|             |                                    | M12 | 9.95       | 1.75      | 2 | 250                       | 0.090                  | 8000                     | 246                         | 1440                       |
|             |                                    | M16 | 13.20      | 2.00      | 2 | 250                       | 0.120                  | 6030                     | 253                         | 1445                       |
|             | Aluminium corroyé<br>Si < 6%       | M 4 | 3.20       | 0.70      | 2 | 200                       | 0.030                  | 19895                    | 239                         | 1195                       |
|             |                                    | M 5 | 4.00       | 0.80      | 2 | 200                       | 0.035                  | 15915                    | 223                         | 1115                       |
|             |                                    | M 6 | 4.75       | 1.00      | 2 | 200                       | 0.045                  | 13405                    | 251                         | 1205                       |
|             |                                    | M 8 | 6.35       | 1.25      | 2 | 200                       | 0.060                  | 10025                    | 249                         | 1205                       |
|             |                                    | M10 | 7.95       | 1.50      | 2 | 200                       | 0.070                  | 8010                     | 230                         | 1120                       |
|             |                                    | M12 | 9.95       | 1.75      | 2 | 200                       | 0.090                  | 6400                     | 196                         | 1150                       |
|             |                                    | M16 | 13.20      | 2.00      | 2 | 200                       | 0.120                  | 4825                     | 203                         | 1160                       |
|             | Recommandation:<br>sans revêtement |     |            |           |   |                           |                        |                          |                             |                            |
|             | Laiton à copeaux courts<br>CuZn    | M 4 | 3.20       | 0.70      | 2 | 250                       | 0.030                  | 24870                    | 298                         | 1490                       |
|             |                                    | M 5 | 4.00       | 0.80      | 2 | 250                       | 0.035                  | 19895                    | 279                         | 1395                       |
|             |                                    | M 6 | 4.75       | 1.00      | 2 | 250                       | 0.045                  | 16755                    | 315                         | 1510                       |
|             |                                    | M 8 | 6.35       | 1.25      | 2 | 250                       | 0.060                  | 12530                    | 310                         | 1505                       |
|             |                                    | M10 | 7.95       | 1.50      | 2 | 250                       | 0.070                  | 10010                    | 287                         | 1400                       |
|             |                                    | M12 | 9.95       | 1.75      | 2 | 250                       | 0.090                  | 8000                     | 246                         | 1440                       |
|             |                                    | M16 | 13.20      | 2.00      | 2 | 250                       | 0.120                  | 6030                     | 253                         | 1445                       |

Données de coupe pour outils à revêtement TiCN

1.5xd, chanfrein à 45°, Incool



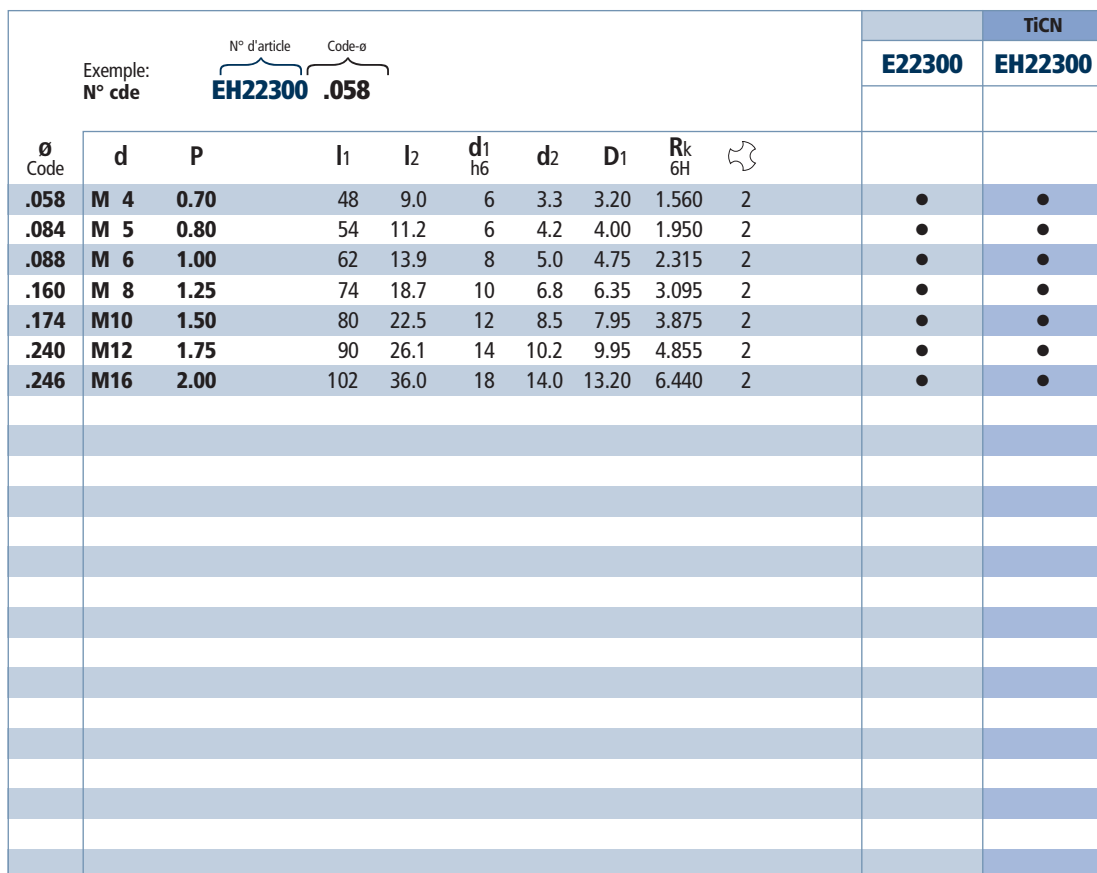
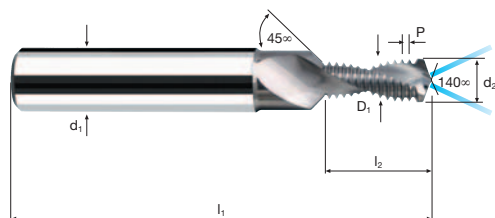
| Application                                                                      | Matières                        | M    | d <sub>2</sub><br>[mm] | v <sub>c</sub><br>[m/min] | f<br>[mm] | L <sub>K</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] |
|----------------------------------------------------------------------------------|---------------------------------|------|------------------------|---------------------------|-----------|------------------------|---------------------------|----------------------------|
|  | Fonte<br>GG(G)                  | M 4  | 3.30                   | 100                       | 0.050     | 9.5                    | 9645                      | 480                        |
|                                                                                  |                                 | M 5  | 4.20                   | 100                       | 0.065     | 11.8                   | 7580                      | 495                        |
|                                                                                  |                                 | M 6  | 5.00                   | 100                       | 0.075     | 14.7                   | 6365                      | 475                        |
|                                                                                  |                                 | M 8  | 6.80                   | 100                       | 0.100     | 19.7                   | 4680                      | 470                        |
|                                                                                  |                                 | M 10 | 8.50                   | 100                       | 0.125     | 23.8                   | 3745                      | 470                        |
|                                                                                  |                                 | M 12 | 10.20                  | 100                       | 0.150     | 27.4                   | 3120                      | 470                        |
|                                                                                  |                                 | M 16 | 14.00                  | 100                       | 0.210     | 37.8                   | 2275                      | 480                        |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |
|                                                                                  | Fonte d'aluminium               | M 4  | 3.30                   | 250                       | 0.060     | 9.5                    | 24115                     | 1445                       |
|                                                                                  |                                 | M 5  | 4.20                   | 250                       | 0.075     | 11.8                   | 18950                     | 1420                       |
|                                                                                  |                                 | M 6  | 5.00                   | 250                       | 0.090     | 14.7                   | 15915                     | 1430                       |
|                                                                                  |                                 | M 8  | 6.80                   | 250                       | 0.120     | 19.7                   | 11705                     | 1405                       |
|                                                                                  |                                 | M 10 | 8.50                   | 250                       | 0.150     | 23.8                   | 9360                      | 1405                       |
|                                                                                  |                                 | M 12 | 10.20                  | 250                       | 0.180     | 27.4                   | 7800                      | 1405                       |
|                                                                                  |                                 | M 16 | 14.00                  | 250                       | 0.250     | 37.8                   | 5685                      | 1420                       |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |
|                                                                                  | Aluminium corroyé<br>Si < 6%    | M 4  | 3.30                   | 200                       | 0.060     | 9.5                    | 19290                     | 1155                       |
|                                                                                  |                                 | M 5  | 4.20                   | 200                       | 0.075     | 11.8                   | 15160                     | 1135                       |
|                                                                                  |                                 | M 6  | 5.00                   | 200                       | 0.090     | 14.7                   | 12735                     | 1145                       |
|                                                                                  |                                 | M 8  | 6.80                   | 200                       | 0.120     | 19.7                   | 9360                      | 1125                       |
|                                                                                  |                                 | M 10 | 8.50                   | 200                       | 0.150     | 23.8                   | 7490                      | 1125                       |
|                                                                                  |                                 | M 12 | 10.20                  | 200                       | 0.180     | 27.4                   | 6240                      | 1125                       |
|                                                                                  |                                 | M 16 | 14.00                  | 200                       | 0.250     | 37.8                   | 4545                      | 1135                       |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |
|                                                                                  | Laiton à copeaux courts<br>CuZn | M 4  | 3.30                   | 250                       | 0.060     | 9.5                    | 24115                     | 1445                       |
|                                                                                  |                                 | M 5  | 4.20                   | 250                       | 0.075     | 11.8                   | 18950                     | 1420                       |
|                                                                                  |                                 | M 6  | 5.00                   | 250                       | 0.090     | 14.7                   | 15915                     | 1430                       |
|                                                                                  |                                 | M 8  | 6.80                   | 250                       | 0.120     | 19.7                   | 11705                     | 1405                       |
|                                                                                  |                                 | M 10 | 8.50                   | 250                       | 0.150     | 23.8                   | 9360                      | 1405                       |
|                                                                                  |                                 | M 12 | 10.20                  | 250                       | 0.180     | 27.4                   | 7800                      | 1405                       |
|                                                                                  |                                 | M 16 | 14.00                  | 250                       | 0.250     | 37.8                   | 5685                      | 1420                       |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |
|                                                                                  |                                 |      |                        |                           |           |                        |                           |                            |

Données de coupe pour outils à revêtement TiCN

| Application                                                                       | Matières                        | M    | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>fc</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|-----------------------------------------------------------------------------------|---------------------------------|------|------------|-----------|---|---------------------------|------------------------|--------------------------|-----------------------------|----------------------------|
|  | Fonte<br>GG(G)                  | M 4  | 3.20       | 0.70      | 2 | 100                       | 0.020                  | 9945                     | 80                          | 400                        |
|                                                                                   |                                 | M 5  | 4.00       | 0.80      | 2 | 100                       | 0.025                  | 7960                     | 80                          | 400                        |
|                                                                                   |                                 | M 6  | 4.75       | 1.00      | 2 | 100                       | 0.030                  | 6700                     | 83                          | 400                        |
|                                                                                   |                                 | M 8  | 6.35       | 1.25      | 2 | 100                       | 0.040                  | 5015                     | 83                          | 400                        |
|                                                                                   |                                 | M 10 | 7.95       | 1.50      | 2 | 100                       | 0.055                  | 4005                     | 90                          | 440                        |
|                                                                                   |                                 | M 12 | 9.95       | 1.75      | 2 | 100                       | 0.065                  | 3200                     | 71                          | 415                        |
|                                                                                   |                                 | M 16 | 13.20      | 2.00      | 2 | 100                       | 0.090                  | 2410                     | 76                          | 435                        |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |
|                                                                                   | Fonte d'aluminium               | M 4  | 3.20       | 0.70      | 2 | 250                       | 0.025                  | 24870                    | 249                         | 1245                       |
|                                                                                   |                                 | M 5  | 4.00       | 0.80      | 2 | 250                       | 0.030                  | 19895                    | 239                         | 1195                       |
|                                                                                   |                                 | M 6  | 4.75       | 1.00      | 2 | 250                       | 0.035                  | 16755                    | 245                         | 1175                       |
|                                                                                   |                                 | M 8  | 6.35       | 1.25      | 2 | 250                       | 0.050                  | 12530                    | 259                         | 1255                       |
|                                                                                   |                                 | M 10 | 7.95       | 1.50      | 2 | 250                       | 0.060                  | 10010                    | 246                         | 1200                       |
|                                                                                   |                                 | M 12 | 9.95       | 1.75      | 2 | 250                       | 0.075                  | 8000                     | 205                         | 1200                       |
|                                                                                   |                                 | M 16 | 13.20      | 2.00      | 2 | 250                       | 0.100                  | 6030                     | 211                         | 1205                       |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |
|                                                                                   | Aluminium corroyé<br>Si < 6%    | M 4  | 3.20       | 0.70      | 2 | 200                       | 0.025                  | 19895                    | 199                         | 995                        |
|                                                                                   |                                 | M 5  | 4.00       | 0.80      | 2 | 200                       | 0.030                  | 15915                    | 191                         | 955                        |
|                                                                                   |                                 | M 6  | 4.75       | 1.00      | 2 | 200                       | 0.035                  | 13405                    | 196                         | 940                        |
|                                                                                   |                                 | M 8  | 6.35       | 1.25      | 2 | 200                       | 0.050                  | 10025                    | 207                         | 1005                       |
|                                                                                   |                                 | M 10 | 7.95       | 1.50      | 2 | 200                       | 0.060                  | 8010                     | 197                         | 960                        |
|                                                                                   |                                 | M 12 | 9.95       | 1.75      | 2 | 200                       | 0.075                  | 6400                     | 164                         | 960                        |
|                                                                                   |                                 | M 16 | 13.20      | 2.00      | 2 | 200                       | 0.100                  | 4825                     | 169                         | 965                        |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |
|                                                                                   | Laiton à copeaux courts<br>CuZn | M 4  | 3.20       | 0.70      | 2 | 250                       | 0.025                  | 24870                    | 249                         | 1245                       |
|                                                                                   |                                 | M 5  | 4.00       | 0.80      | 2 | 250                       | 0.030                  | 19895                    | 239                         | 1195                       |
|                                                                                   |                                 | M 6  | 4.75       | 1.00      | 2 | 250                       | 0.035                  | 16755                    | 245                         | 1175                       |
|                                                                                   |                                 | M 8  | 6.35       | 1.25      | 2 | 250                       | 0.050                  | 12530                    | 259                         | 1255                       |
|                                                                                   |                                 | M 10 | 7.95       | 1.50      | 2 | 250                       | 0.060                  | 10010                    | 246                         | 1200                       |
|                                                                                   |                                 | M 12 | 9.95       | 1.75      | 2 | 250                       | 0.075                  | 8000                     | 205                         | 1200                       |
|                                                                                   |                                 | M 16 | 13.20      | 2.00      | 2 | 250                       | 0.100                  | 6030                     | 211                         | 1205                       |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |
|                                                                                   |                                 |      |            |           |   |                           |                        |                          |                             |                            |

Données de coupe pour outils à revêtement TiCN

2.0xd, chanfrein à 45°, Incool



## Application



## Matières

Aciers  
850 - 1100 N/mm<sup>2</sup>

| M    | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|-----------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------|----------------------------|
| M 3  | 2.30       | 0.50      | 3 | 80                        | 0.0060                 | 5.7                    | 11070                    | 47                         | 200                        |
| M 4  | 3.00       | 0.70      | 3 | 80                        | 0.0075                 | 8.0                    | 8490                     | 48                         | 190                        |
| M 5  | 4.00       | 0.80      | 3 | 80                        | 0.0100                 | 9.8                    | 6365                     | 38                         | 190                        |
| M 6  | 4.80       | 1.00      | 3 | 80                        | 0.0120                 | 11.3                   | 5305                     | 38                         | 190                        |
| M 8  | 6.40       | 1.25      | 3 | 80                        | 0.0160                 | 14.1                   | 3980                     | 38                         | 190                        |
| M 10 | 7.95       | 1.50      | 4 | 80                        | 0.0200                 | 18.6                   | 3205                     | 52                         | 255                        |
| M 12 | 9.95       | 1.75      | 4 | 80                        | 0.0250                 | 21.4                   | 2560                     | 44                         | 255                        |
| M 16 | 12.80      | 2.00      | 4 | 80                        | 0.0320                 | 29.0                   | 1990                     | 51                         | 255                        |

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|      |       |      |   |    |        |      |      |    |     |
|------|-------|------|---|----|--------|------|------|----|-----|
| M 3  | 2.30  | 0.50 | 3 | 50 | 0.0050 | 5.7  | 6920 | 25 | 105 |
| M 4  | 3.00  | 0.70 | 3 | 50 | 0.0065 | 8.0  | 5305 | 26 | 105 |
| M 5  | 4.00  | 0.80 | 3 | 50 | 0.0090 | 9.8  | 3980 | 21 | 105 |
| M 6  | 4.80  | 1.00 | 3 | 50 | 0.0105 | 11.3 | 3315 | 21 | 105 |
| M 8  | 6.40  | 1.25 | 3 | 50 | 0.0140 | 14.1 | 2485 | 21 | 105 |
| M 10 | 7.95  | 1.50 | 4 | 50 | 0.0175 | 18.6 | 2000 | 29 | 140 |
| M 12 | 9.95  | 1.75 | 4 | 50 | 0.0220 | 21.4 | 1600 | 24 | 140 |
| M 16 | 12.80 | 2.00 | 4 | 50 | 0.0285 | 29.0 | 1245 | 28 | 140 |

Aciers à outil trempés  
48 - 52 HRC

|      |       |      |   |    |        |      |      |    |    |
|------|-------|------|---|----|--------|------|------|----|----|
| M 3  | 2.30  | 0.50 | 3 | 30 | 0.0040 | 5.7  | 4150 | 12 | 50 |
| M 4  | 3.00  | 0.70 | 3 | 30 | 0.0050 | 8.0  | 3185 | 13 | 50 |
| M 5  | 4.00  | 0.80 | 3 | 30 | 0.0065 | 9.8  | 2385 | 9  | 45 |
| M 6  | 4.80  | 1.00 | 3 | 30 | 0.0080 | 11.3 | 1990 | 10 | 50 |
| M 8  | 6.40  | 1.25 | 3 | 30 | 0.0105 | 14.1 | 1490 | 9  | 45 |
| M 10 | 7.95  | 1.50 | 4 | 30 | 0.0135 | 18.6 | 1200 | 13 | 65 |
| M 12 | 9.95  | 1.75 | 4 | 30 | 0.0165 | 21.4 | 960  | 11 | 65 |
| M 16 | 12.80 | 2.00 | 4 | 30 | 0.0215 | 29.0 | 745  | 13 | 65 |

Aciers inoxydables  
[Cr-Ni/1.4301]

|      |       |      |   |    |        |      |      |    |     |
|------|-------|------|---|----|--------|------|------|----|-----|
| M 3  | 2.30  | 0.50 | 3 | 50 | 0.0040 | 5.7  | 6920 | 20 | 85  |
| M 4  | 3.00  | 0.70 | 3 | 50 | 0.0050 | 8.0  | 5305 | 20 | 80  |
| M 5  | 4.00  | 0.80 | 3 | 50 | 0.0065 | 9.8  | 3980 | 16 | 80  |
| M 6  | 4.80  | 1.00 | 3 | 50 | 0.0080 | 11.3 | 3315 | 16 | 80  |
| M 8  | 6.40  | 1.25 | 3 | 50 | 0.0105 | 14.1 | 2485 | 16 | 80  |
| M 10 | 7.95  | 1.50 | 4 | 50 | 0.0135 | 18.6 | 2000 | 23 | 110 |
| M 12 | 9.95  | 1.75 | 4 | 50 | 0.0165 | 21.4 | 1600 | 18 | 105 |
| M 16 | 12.80 | 2.00 | 4 | 50 | 0.0215 | 29.0 | 1245 | 21 | 105 |

## Matières

Fonte  
GG(G)

| M    | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|-----------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------|----------------------------|
| M 3  | 2.30       | 0.50      | 3 | 120                       | 0.0060                 | 5.7                    | 16610                    | 70                         | 300                        |
| M 4  | 3.00       | 0.70      | 3 | 120                       | 0.0075                 | 8.0                    | 12735                    | 71                         | 285                        |
| M 5  | 4.00       | 0.80      | 3 | 120                       | 0.0100                 | 9.8                    | 9550                     | 57                         | 285                        |
| M 6  | 4.80       | 1.00      | 3 | 120                       | 0.0120                 | 11.3                   | 7960                     | 57                         | 285                        |
| M 8  | 6.40       | 1.25      | 3 | 120                       | 0.0160                 | 14.1                   | 5970                     | 57                         | 285                        |
| M 10 | 7.95       | 1.50      | 4 | 120                       | 0.0200                 | 18.6                   | 4805                     | 79                         | 385                        |
| M 12 | 9.95       | 1.75      | 4 | 120                       | 0.0250                 | 21.4                   | 3840                     | 66                         | 385                        |
| M 16 | 12.80      | 2.00      | 4 | 120                       | 0.0320                 | 29.0                   | 2985                     | 76                         | 380                        |

Aluminium corroyé  
Si < 6%

|      |       |      |   |     |        |      |       |     |     |
|------|-------|------|---|-----|--------|------|-------|-----|-----|
| M 3  | 2.30  | 0.50 | 3 | 150 | 0.0080 | 5.7  | 20760 | 117 | 500 |
| M 4  | 3.00  | 0.70 | 3 | 150 | 0.0105 | 8.0  | 15915 | 125 | 500 |
| M 5  | 4.00  | 0.80 | 3 | 150 | 0.0140 | 9.8  | 11935 | 100 | 500 |
| M 6  | 4.80  | 1.00 | 3 | 150 | 0.0170 | 11.3 | 9945  | 101 | 505 |
| M 8  | 6.40  | 1.25 | 3 | 150 | 0.0225 | 14.1 | 7460  | 101 | 505 |
| M 10 | 7.95  | 1.50 | 4 | 150 | 0.0280 | 18.6 | 6005  | 138 | 675 |
| M 12 | 9.95  | 1.75 | 4 | 150 | 0.0350 | 21.4 | 4800  | 114 | 670 |
| M 16 | 12.80 | 2.00 | 4 | 150 | 0.0450 | 29.0 | 3730  | 134 | 670 |

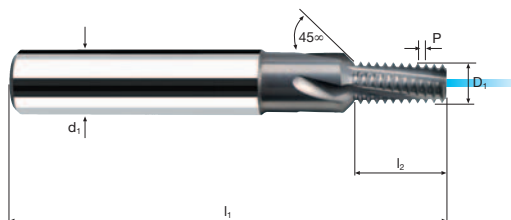
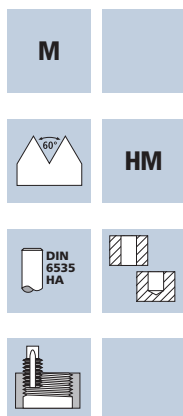
Fonte d'aluminium

|      |       |      |   |     |        |      |       |     |     |
|------|-------|------|---|-----|--------|------|-------|-----|-----|
| M 3  | 2.30  | 0.50 | 3 | 200 | 0.0080 | 5.7  | 27680 | 155 | 665 |
| M 4  | 3.00  | 0.70 | 3 | 200 | 0.0105 | 8.0  | 21220 | 168 | 670 |
| M 5  | 4.00  | 0.80 | 3 | 200 | 0.0140 | 9.8  | 15915 | 134 | 670 |
| M 6  | 4.80  | 1.00 | 3 | 200 | 0.0170 | 11.3 | 13265 | 135 | 675 |
| M 8  | 6.40  | 1.25 | 3 | 200 | 0.0225 | 14.1 | 9945  | 134 | 670 |
| M 10 | 7.95  | 1.50 | 4 | 200 | 0.0280 | 18.6 | 8010  | 183 | 895 |
| M 12 | 9.95  | 1.75 | 4 | 200 | 0.0350 | 21.4 | 6400  | 153 | 895 |
| M 16 | 12.80 | 2.00 | 4 | 200 | 0.0450 | 29.0 | 4975  | 179 | 895 |

Titanes alliés trempés  
> 300 HB  
[Ti6Al4V]

|      |       |      |   |    |        |      |      |    |    |
|------|-------|------|---|----|--------|------|------|----|----|
| M 3  | 2.30  | 0.50 | 3 | 40 | 0.0040 | 5.7  | 5535 | 15 | 65 |
| M 4  | 3.00  | 0.70 | 3 | 40 | 0.0050 | 8.0  | 4245 | 16 | 65 |
| M 5  | 4.00  | 0.80 | 3 | 40 | 0.0065 | 9.8  | 3185 | 12 | 60 |
| M 6  | 4.80  | 1.00 | 3 | 40 | 0.0080 | 11.3 | 2655 | 13 | 65 |
| M 8  | 6.40  | 1.25 | 3 | 40 | 0.0105 | 14.1 | 1990 | 13 | 65 |
| M 10 | 7.95  | 1.50 | 4 | 40 | 0.0135 | 18.6 | 1600 | 17 | 85 |
| M 12 | 9.95  | 1.75 | 4 | 40 | 0.0165 | 21.4 | 1280 | 15 | 85 |
| M 16 | 12.80 | 2.00 | 4 | 40 | 0.0215 | 29.0 | 995  | 17 | 85 |

1.5xd, chanfrein à 45°, Incool



|                    |                       |                        |                        |                     |  |  |                          |                       |                           |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Aluminium</b><br>GG(G) |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|

[illegible]

## Application



## Matières

Aciers  
850 - 1100 N/mm<sup>2</sup>

| M    | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|-----------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------|----------------------------|
| M 3  | 2.30       | 0.50      | 3 | 80                        | 0.0055                 | 7.2                    | 11070                    | 43                         | 185                        |
| M 4  | 3.00       | 0.70      | 3 | 80                        | 0.0070                 | 9.4                    | 8490                     | 45                         | 180                        |
| M 5  | 4.00       | 0.80      | 3 | 80                        | 0.0090                 | 11.4                   | 6365                     | 34                         | 170                        |
| M 6  | 4.80       | 1.00      | 3 | 80                        | 0.0110                 | 14.3                   | 5305                     | 35                         | 175                        |
| M 8  | 6.40       | 1.25      | 3 | 80                        | 0.0145                 | 19.1                   | 3980                     | 35                         | 175                        |
| M 10 | 7.95       | 1.50      | 4 | 80                        | 0.0180                 | 23.1                   | 3205                     | 47                         | 230                        |
| M 12 | 9.95       | 1.75      | 4 | 80                        | 0.0225                 | 26.7                   | 2560                     | 39                         | 230                        |
| M 16 | 12.80      | 2.00      | 4 | 80                        | 0.0290                 | 37.0                   | 1990                     | 46                         | 230                        |

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|      |       |      |   |    |        |      |      |    |     |
|------|-------|------|---|----|--------|------|------|----|-----|
| M 3  | 2.30  | 0.50 | 3 | 50 | 0.0045 | 7.2  | 6920 | 22 | 95  |
| M 4  | 3.00  | 0.70 | 3 | 50 | 0.0060 | 9.4  | 5305 | 24 | 95  |
| M 5  | 4.00  | 0.80 | 3 | 50 | 0.0080 | 11.4 | 3980 | 19 | 95  |
| M 6  | 4.80  | 1.00 | 3 | 50 | 0.0095 | 14.3 | 3315 | 19 | 95  |
| M 8  | 6.40  | 1.25 | 3 | 50 | 0.0125 | 19.1 | 2485 | 19 | 95  |
| M 10 | 7.95  | 1.50 | 4 | 50 | 0.0160 | 23.1 | 2000 | 27 | 130 |
| M 12 | 9.95  | 1.75 | 4 | 50 | 0.0200 | 26.7 | 1600 | 22 | 130 |
| M 16 | 12.80 | 2.00 | 4 | 50 | 0.0255 | 37.0 | 1245 | 25 | 125 |

Aciers à outil trempés  
48 - 52 HRC

|      |       |      |   |    |        |      |      |    |    |
|------|-------|------|---|----|--------|------|------|----|----|
| M 3  | 2.30  | 0.50 | 3 | 30 | 0.0035 | 7.2  | 4150 | 11 | 45 |
| M 4  | 3.00  | 0.70 | 3 | 30 | 0.0045 | 9.4  | 3185 | 11 | 45 |
| M 5  | 4.00  | 0.80 | 3 | 30 | 0.0060 | 11.4 | 2385 | 9  | 45 |
| M 6  | 4.80  | 1.00 | 3 | 30 | 0.0070 | 14.3 | 1990 | 8  | 40 |
| M 8  | 6.40  | 1.25 | 3 | 30 | 0.0095 | 19.1 | 1490 | 8  | 40 |
| M 10 | 7.95  | 1.50 | 4 | 30 | 0.0120 | 23.1 | 1200 | 12 | 60 |
| M 12 | 9.95  | 1.75 | 4 | 30 | 0.0150 | 26.7 | 960  | 10 | 60 |
| M 16 | 12.80 | 2.00 | 4 | 30 | 0.0195 | 37.0 | 745  | 12 | 60 |

Aciers inoxydables  
[Cr-Ni/1.4301]

|      |       |      |   |    |        |      |      |    |    |
|------|-------|------|---|----|--------|------|------|----|----|
| M 3  | 2.30  | 0.50 | 3 | 50 | 0.0035 | 7.2  | 6920 | 18 | 75 |
| M 4  | 3.00  | 0.70 | 3 | 50 | 0.0045 | 9.4  | 5305 | 18 | 70 |
| M 5  | 4.00  | 0.80 | 3 | 50 | 0.0060 | 11.4 | 3980 | 14 | 70 |
| M 6  | 4.80  | 1.00 | 3 | 50 | 0.0070 | 14.3 | 3315 | 14 | 70 |
| M 8  | 6.40  | 1.25 | 3 | 50 | 0.0095 | 19.1 | 2485 | 14 | 70 |
| M 10 | 7.95  | 1.50 | 4 | 50 | 0.0120 | 23.1 | 2000 | 19 | 95 |
| M 12 | 9.95  | 1.75 | 4 | 50 | 0.0150 | 26.7 | 1600 | 16 | 95 |
| M 16 | 12.80 | 2.00 | 4 | 50 | 0.0195 | 37.0 | 1245 | 19 | 95 |

## Matières

Fonte  
GG(G)

| M    | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|-----------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------|----------------------------|
| M 3  | 2.30       | 0.50      | 3 | 120                       | 0.0055                 | 7.2                    | 16610                    | 64                         | 275                        |
| M 4  | 3.00       | 0.70      | 3 | 120                       | 0.0070                 | 9.4                    | 12735                    | 66                         | 265                        |
| M 5  | 4.00       | 0.80      | 3 | 120                       | 0.0090                 | 11.4                   | 9550                     | 52                         | 260                        |
| M 6  | 4.80       | 1.00      | 3 | 120                       | 0.0110                 | 14.3                   | 7960                     | 53                         | 265                        |
| M 8  | 6.40       | 1.25      | 3 | 120                       | 0.0145                 | 19.1                   | 5970                     | 52                         | 260                        |
| M 10 | 7.95       | 1.50      | 4 | 120                       | 0.0180                 | 23.1                   | 4805                     | 71                         | 345                        |
| M 12 | 9.95       | 1.75      | 4 | 120                       | 0.0225                 | 26.7                   | 3840                     | 59                         | 345                        |
| M 16 | 12.80      | 2.00      | 4 | 120                       | 0.0290                 | 37.0                   | 2985                     | 69                         | 345                        |

Aluminium corroyé  
Si < 6%

|      |       |      |   |     |        |      |       |     |     |
|------|-------|------|---|-----|--------|------|-------|-----|-----|
| M 3  | 2.30  | 0.50 | 3 | 150 | 0.0070 | 7.2  | 20760 | 102 | 435 |
| M 4  | 3.00  | 0.70 | 3 | 150 | 0.0095 | 9.4  | 15915 | 114 | 455 |
| M 5  | 4.00  | 0.80 | 3 | 150 | 0.0125 | 11.4 | 11935 | 90  | 450 |
| M 6  | 4.80  | 1.00 | 3 | 150 | 0.0155 | 14.3 | 9945  | 92  | 460 |
| M 8  | 6.40  | 1.25 | 3 | 150 | 0.0205 | 19.1 | 7460  | 92  | 460 |
| M 10 | 7.95  | 1.50 | 4 | 150 | 0.0250 | 23.1 | 6005  | 123 | 600 |
| M 12 | 9.95  | 1.75 | 4 | 150 | 0.0315 | 26.7 | 4800  | 103 | 605 |
| M 16 | 12.80 | 2.00 | 4 | 150 | 0.0405 | 37.0 | 3730  | 121 | 605 |

Fonte d'aluminium

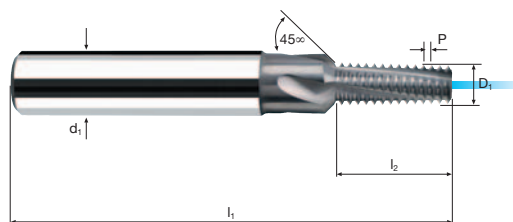
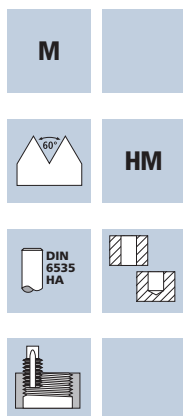
|      |       |      |   |     |        |      |       |     |     |
|------|-------|------|---|-----|--------|------|-------|-----|-----|
| M 3  | 2.30  | 0.50 | 3 | 200 | 0.0070 | 7.2  | 27680 | 135 | 580 |
| M 4  | 3.00  | 0.70 | 3 | 200 | 0.0095 | 9.4  | 21220 | 151 | 605 |
| M 5  | 4.00  | 0.80 | 3 | 200 | 0.0125 | 11.4 | 15915 | 119 | 595 |
| M 6  | 4.80  | 1.00 | 3 | 200 | 0.0155 | 14.3 | 13265 | 123 | 615 |
| M 8  | 6.40  | 1.25 | 3 | 200 | 0.0205 | 19.1 | 9945  | 122 | 610 |
| M 10 | 7.95  | 1.50 | 4 | 200 | 0.0250 | 23.1 | 8010  | 164 | 800 |
| M 12 | 9.95  | 1.75 | 4 | 200 | 0.0315 | 26.7 | 6400  | 138 | 805 |
| M 16 | 12.80 | 2.00 | 4 | 200 | 0.0405 | 37.0 | 4975  | 161 | 805 |

Titanes alliés trempés  
> 300 HB  
[Ti6Al4V]

|      |       |      |   |    |        |      |      |    |    |
|------|-------|------|---|----|--------|------|------|----|----|
| M 3  | 2.30  | 0.50 | 3 | 40 | 0.0035 | 7.2  | 5535 | 14 | 60 |
| M 4  | 3.00  | 0.70 | 3 | 40 | 0.0045 | 9.4  | 4245 | 14 | 55 |
| M 5  | 4.00  | 0.80 | 3 | 40 | 0.0060 | 11.4 | 3185 | 11 | 55 |
| M 6  | 4.80  | 1.00 | 3 | 40 | 0.0070 | 14.3 | 2655 | 11 | 55 |
| M 8  | 6.40  | 1.25 | 3 | 40 | 0.0095 | 19.1 | 1990 | 11 | 55 |
| M 10 | 7.95  | 1.50 | 4 | 40 | 0.0120 | 23.1 | 1600 | 15 | 75 |
| M 12 | 9.95  | 1.75 | 4 | 40 | 0.0150 | 26.7 | 1280 | 13 | 75 |
| M 16 | 12.80 | 2.00 | 4 | 40 | 0.0195 | 37.0 | 995  | 16 | 80 |



2.0xd, chanfrein à 45°, Incool



|                    |                       |                        |                        |                     |  |  |                          |                       |                           |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Aluminium</b><br>GG(G) |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|

[illegible]

## Application



## Matières

Aciers  
850 - 1100 N/mm²

| MF   | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|-----------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------|----------------------------|
| M 4  | 3.00       | 0.50      | 3 | 80                        | 0.0075                 | 7.9                    | 8490                     | 48                         | 190                        |
| M 5  | 4.00       | 0.50      | 3 | 80                        | 0.0100                 | 9.4                    | 6365                     | 38                         | 190                        |
| M 6  | 4.80       | 0.50      | 3 | 80                        | 0.0120                 | 10.6                   | 5305                     | 38                         | 190                        |
| M 6  | 4.80       | 0.75      | 3 | 80                        | 0.0120                 | 10.8                   | 5305                     | 38                         | 190                        |
| M 8  | 6.40       | 0.75      | 3 | 80                        | 0.0160                 | 14.1                   | 3980                     | 38                         | 190                        |
| M 8  | 6.40       | 1.00      | 3 | 80                        | 0.0160                 | 14.5                   | 3980                     | 38                         | 190                        |
| M 10 | 7.95       | 1.00      | 4 | 80                        | 0.0200                 | 17.8                   | 3205                     | 52                         | 255                        |
| M 10 | 7.95       | 1.25      | 4 | 80                        | 0.0200                 | 18.2                   | 3205                     | 52                         | 255                        |
| M 12 | 9.95       | 1.00      | 4 | 80                        | 0.0250                 | 20.8                   | 2560                     | 44                         | 255                        |

Aciers  
850 - 1100 N/mm²

|      |       |      |   |    |        |      |      |    |     |
|------|-------|------|---|----|--------|------|------|----|-----|
| M 12 | 9.95  | 1.50 | 4 | 80 | 0.0250 | 21.6 | 2560 | 44 | 255 |
| M 14 | 11.20 | 1.50 | 4 | 80 | 0.0280 | 25.1 | 2275 | 51 | 255 |
| M 16 | 12.80 | 1.50 | 4 | 80 | 0.0320 | 28.3 | 1990 | 51 | 255 |

Aciers  
1300 - 1500 N/mm²

|      |      |      |   |    |        |      |      |    |     |
|------|------|------|---|----|--------|------|------|----|-----|
| M 4  | 3.00 | 0.50 | 3 | 50 | 0.0065 | 7.9  | 5305 | 26 | 105 |
| M 5  | 4.00 | 0.50 | 3 | 50 | 0.0090 | 9.4  | 3980 | 21 | 105 |
| M 6  | 4.80 | 0.50 | 3 | 50 | 0.0105 | 10.6 | 3315 | 21 | 105 |
| M 6  | 4.80 | 0.75 | 3 | 50 | 0.0105 | 10.8 | 3315 | 21 | 105 |
| M 8  | 6.40 | 0.75 | 3 | 50 | 0.0140 | 14.1 | 2485 | 21 | 105 |
| M 8  | 6.40 | 1.00 | 3 | 50 | 0.0140 | 14.5 | 2485 | 21 | 105 |
| M 10 | 7.95 | 1.00 | 4 | 50 | 0.0175 | 17.8 | 2000 | 29 | 140 |
| M 10 | 7.95 | 1.25 | 4 | 50 | 0.0175 | 18.2 | 2000 | 29 | 140 |
| M 12 | 9.95 | 1.00 | 4 | 50 | 0.0220 | 20.8 | 1600 | 24 | 140 |

Aciers  
1300 - 1500 N/mm²

|      |       |      |   |    |        |      |      |    |     |
|------|-------|------|---|----|--------|------|------|----|-----|
| M 12 | 9.95  | 1.50 | 4 | 50 | 0.0220 | 21.6 | 1600 | 24 | 140 |
| M 14 | 11.20 | 1.50 | 4 | 50 | 0.0250 | 25.1 | 1420 | 28 | 140 |
| M 16 | 12.80 | 1.50 | 4 | 50 | 0.0285 | 28.3 | 1245 | 28 | 140 |

## Matières

Aluminium corroyé  
Si < 6%

| MF   | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|-----------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------|----------------------------|
| M 4  | 3.00       | 0.50      | 3 | 150                       | 0.0105                 | 7.9                    | 15915                    | 125                        | 500                        |
| M 5  | 4.00       | 0.50      | 3 | 150                       | 0.0140                 | 9.4                    | 11935                    | 100                        | 500                        |
| M 6  | 4.80       | 0.50      | 3 | 150                       | 0.0170                 | 10.6                   | 9945                     | 101                        | 505                        |
| M 6  | 4.80       | 0.75      | 3 | 150                       | 0.0170                 | 10.8                   | 9945                     | 101                        | 505                        |
| M 8  | 6.40       | 0.75      | 3 | 150                       | 0.0225                 | 14.1                   | 7460                     | 101                        | 505                        |
| M 8  | 6.40       | 1.00      | 3 | 150                       | 0.0225                 | 14.5                   | 7460                     | 101                        | 505                        |
| M 10 | 7.95       | 1.00      | 4 | 150                       | 0.0280                 | 17.8                   | 6005                     | 138                        | 675                        |
| M 10 | 7.95       | 1.25      | 4 | 150                       | 0.0280                 | 18.2                   | 6005                     | 138                        | 675                        |
| M 12 | 9.95       | 1.00      | 4 | 150                       | 0.0350                 | 20.8                   | 4800                     | 114                        | 670                        |

Aluminium corroyé  
Si < 6%

|      |       |      |   |     |        |      |      |     |     |
|------|-------|------|---|-----|--------|------|------|-----|-----|
| M 12 | 9.95  | 1.50 | 4 | 150 | 0.0350 | 21.6 | 4800 | 114 | 670 |
| M 14 | 11.20 | 1.50 | 4 | 150 | 0.0395 | 25.1 | 4265 | 135 | 675 |
| M 16 | 12.80 | 1.50 | 4 | 150 | 0.0450 | 28.3 | 3730 | 134 | 670 |

Fonte  
GG(G)

|      |      |      |   |     |        |      |       |    |     |
|------|------|------|---|-----|--------|------|-------|----|-----|
| M 4  | 3.00 | 0.50 | 3 | 120 | 0.0075 | 7.9  | 12735 | 71 | 285 |
| M 5  | 4.00 | 0.50 | 3 | 120 | 0.0100 | 9.4  | 9550  | 57 | 285 |
| M 6  | 4.80 | 0.50 | 3 | 120 | 0.0120 | 10.6 | 7960  | 57 | 285 |
| M 6  | 4.80 | 0.75 | 3 | 120 | 0.0120 | 10.8 | 7960  | 57 | 285 |
| M 8  | 6.40 | 0.75 | 3 | 120 | 0.0160 | 14.1 | 5970  | 57 | 285 |
| M 8  | 6.40 | 1.00 | 3 | 120 | 0.0160 | 14.5 | 5970  | 57 | 285 |
| M 10 | 7.95 | 1.00 | 4 | 120 | 0.0200 | 17.8 | 4805  | 79 | 385 |
| M 10 | 7.95 | 1.25 | 4 | 120 | 0.0200 | 18.2 | 4805  | 79 | 385 |
| M 12 | 9.95 | 1.00 | 4 | 120 | 0.0250 | 20.8 | 3840  | 66 | 385 |

Fonte  
GG(G)

|      |       |      |   |     |        |      |      |    |     |
|------|-------|------|---|-----|--------|------|------|----|-----|
| M 12 | 9.95  | 1.50 | 4 | 120 | 0.0250 | 21.6 | 3840 | 66 | 385 |
| M 14 | 11.20 | 1.50 | 4 | 120 | 0.0280 | 25.1 | 3410 | 76 | 380 |
| M 16 | 12.80 | 1.50 | 4 | 120 | 0.0320 | 28.3 | 2985 | 76 | 380 |

# Fraises à fileter

1.5xd, chanfrein à 45°, Incool

MF

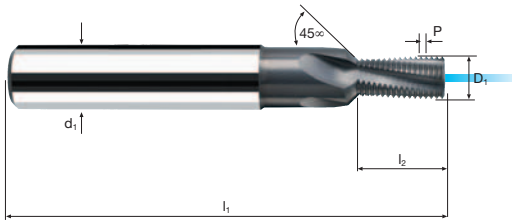


HM









Rm< 850

Rm850-1100

Rm1100-1300

Rm1300-1500

HRC48-56

InoxStainless

TiTitanium

AluminiumGG(G)

|                                                          |     |      |     |      |      |       |       |                                                                                   | TiCN    |
|----------------------------------------------------------|-----|------|-----|------|------|-------|-------|-----------------------------------------------------------------------------------|---------|
| Exemple: N° cde <div>N° d'articleCode-øEH24220.046</div> |     |      |     |      |      |       |       |                                                                                   | EH24220 |
| ØCode                                                    | d   | P    | l1  | l2   | d1h6 | D1    | Rk6H  |  |         |
| .046                                                     | M 4 | 0.50 | 48  | 7.3  | 6    | 3.00  | 1.475 | 3                                                                                 | ●       |
| .048                                                     | M 5 | 0.50 | 54  | 8.8  | 6    | 4.00  | 1.975 | 3                                                                                 | ●       |
| .050                                                     | M 6 | 0.50 | 62  | 9.8  | 8    | 4.80  | 2.375 | 3                                                                                 | ●       |
| .064                                                     | M 6 | 0.75 | 62  | 10.1 | 8    | 4.80  | 2.363 | 3                                                                                 | ●       |
| .066                                                     | M 8 | 0.75 | 74  | 13.1 | 10   | 6.40  | 3.163 | 3                                                                                 | ●       |
| .090                                                     | M 8 | 1.00 | 74  | 13.5 | 10   | 6.40  | 3.150 | 3                                                                                 | ●       |
| .092                                                     | M10 | 1.00 | 80  | 16.5 | 12   | 7.95  | 3.925 | 4                                                                                 | ●       |
| .162                                                     | M10 | 1.25 | 80  | 16.9 | 12   | 7.95  | 3.913 | 4                                                                                 | ●       |
| .094                                                     | M12 | 1.00 | 90  | 19.5 | 14   | 9.95  | 4.925 | 4                                                                                 | ●       |
| .176                                                     | M12 | 1.50 | 90  | 20.3 | 14   | 9.95  | 4.900 | 4                                                                                 | ●       |
| .178                                                     | M14 | 1.50 | 102 | 23.3 | 16   | 11.20 | 5.525 | 4                                                                                 | ●       |
| .180                                                     | M16 | 1.50 | 102 | 26.3 | 18   | 12.80 | 6.325 | 4                                                                                 | ●       |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |
|                                                          |     |      |     |      |      |       |       |                                                                                   |         |

TM

## Application



## Matières

Aciers  
850 - 1100 N/mm<sup>2</sup>

| MF   | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|-----------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------|----------------------------|
| M 4  | 3.00       | 0.50      | 3 | 80                        | 0.0070                 | 9.4                    | 8490                     | 45                         | 180                        |
| M 5  | 4.00       | 0.50      | 3 | 80                        | 0.0090                 | 11.4                   | 6365                     | 34                         | 170                        |
| M 6  | 4.80       | 0.50      | 3 | 80                        | 0.0110                 | 13.6                   | 5305                     | 35                         | 175                        |
| M 6  | 4.80       | 0.75      | 3 | 80                        | 0.0110                 | 13.9                   | 5305                     | 35                         | 175                        |
| M 8  | 6.40       | 0.75      | 3 | 80                        | 0.0145                 | 17.9                   | 3980                     | 35                         | 175                        |
| M 8  | 6.40       | 1.00      | 3 | 80                        | 0.0145                 | 18.5                   | 3980                     | 35                         | 175                        |
| M 10 | 7.95       | 1.00      | 4 | 80                        | 0.0180                 | 22.8                   | 3205                     | 47                         | 230                        |
| M 10 | 7.95       | 1.25      | 4 | 80                        | 0.0180                 | 23.2                   | 3205                     | 47                         | 230                        |
| M 12 | 9.95       | 1.00      | 4 | 80                        | 0.0225                 | 26.8                   | 2560                     | 39                         | 230                        |

Aciers  
850 - 1100 N/mm<sup>2</sup>

|      |       |      |   |    |        |      |      |    |     |
|------|-------|------|---|----|--------|------|------|----|-----|
| M 12 | 9.95  | 1.50 | 4 | 80 | 0.0225 | 27.6 | 2560 | 39 | 230 |
| M 14 | 11.20 | 1.50 | 4 | 80 | 0.0250 | 32.6 | 2275 | 46 | 230 |
| M 16 | 12.80 | 1.50 | 4 | 80 | 0.0290 | 35.8 | 1990 | 46 | 230 |
|      |       |      |   |    |        |      |      |    |     |
|      |       |      |   |    |        |      |      |    |     |
|      |       |      |   |    |        |      |      |    |     |
|      |       |      |   |    |        |      |      |    |     |

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|      |      |      |   |    |        |      |      |    |     |
|------|------|------|---|----|--------|------|------|----|-----|
| M 4  | 3.00 | 0.50 | 3 | 50 | 0.0060 | 9.4  | 5305 | 24 | 95  |
| M 5  | 4.00 | 0.50 | 3 | 50 | 0.0080 | 11.4 | 3980 | 19 | 95  |
| M 6  | 4.80 | 0.50 | 3 | 50 | 0.0095 | 13.6 | 3315 | 19 | 95  |
| M 6  | 4.80 | 0.75 | 3 | 50 | 0.0095 | 13.9 | 3315 | 19 | 95  |
| M 8  | 6.40 | 0.75 | 3 | 50 | 0.0125 | 17.9 | 2485 | 19 | 95  |
| M 8  | 6.40 | 1.00 | 3 | 50 | 0.0125 | 18.5 | 2485 | 19 | 95  |
| M 10 | 7.95 | 1.00 | 4 | 50 | 0.0160 | 22.8 | 2000 | 27 | 130 |
| M 10 | 7.95 | 1.25 | 4 | 50 | 0.0160 | 23.2 | 2000 | 27 | 130 |
| M 12 | 9.95 | 1.00 | 4 | 50 | 0.0200 | 26.8 | 1600 | 22 | 130 |

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|      |       |      |   |    |        |      |      |    |     |
|------|-------|------|---|----|--------|------|------|----|-----|
| M 12 | 9.95  | 1.50 | 4 | 50 | 0.0200 | 27.6 | 1600 | 22 | 130 |
| M 14 | 11.20 | 1.50 | 4 | 50 | 0.0225 | 32.6 | 1420 | 26 | 130 |
| M 16 | 12.80 | 1.50 | 4 | 50 | 0.0255 | 35.8 | 1245 | 25 | 125 |
|      |       |      |   |    |        |      |      |    |     |
|      |       |      |   |    |        |      |      |    |     |
|      |       |      |   |    |        |      |      |    |     |
|      |       |      |   |    |        |      |      |    |     |

## Matières

Aluminium corroyé  
Si < 6%

| MF   | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|-----------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------|----------------------------|
| M 4  | 3.00       | 0.50      | 3 | 150                       | 0.0095                 | 9.4                    | 15915                    | 114                        | 455                        |
| M 5  | 4.00       | 0.50      | 3 | 150                       | 0.0125                 | 11.4                   | 11935                    | 90                         | 450                        |
| M 6  | 4.80       | 0.50      | 3 | 150                       | 0.0155                 | 13.6                   | 9945                     | 92                         | 460                        |
| M 6  | 4.80       | 0.75      | 3 | 150                       | 0.0155                 | 13.9                   | 9945                     | 92                         | 460                        |
| M 8  | 6.40       | 0.75      | 3 | 150                       | 0.0205                 | 17.9                   | 7460                     | 92                         | 460                        |
| M 8  | 6.40       | 1.00      | 3 | 150                       | 0.0205                 | 18.5                   | 7460                     | 92                         | 460                        |
| M 10 | 7.95       | 1.00      | 4 | 150                       | 0.0250                 | 22.8                   | 6005                     | 123                        | 600                        |
| M 10 | 7.95       | 1.25      | 4 | 150                       | 0.0250                 | 23.2                   | 6005                     | 123                        | 600                        |
| M 12 | 9.95       | 1.00      | 4 | 150                       | 0.0315                 | 26.8                   | 4800                     | 103                        | 605                        |

Aluminium corroyé  
Si < 6%

|      |       |      |   |     |        |      |      |     |     |
|------|-------|------|---|-----|--------|------|------|-----|-----|
| M 12 | 9.95  | 1.50 | 4 | 150 | 0.0315 | 27.6 | 4800 | 103 | 605 |
| M 14 | 11.20 | 1.50 | 4 | 150 | 0.0355 | 32.6 | 4265 | 121 | 605 |
| M 16 | 12.80 | 1.50 | 4 | 150 | 0.0405 | 35.8 | 3730 | 121 | 605 |
|      |       |      |   |     |        |      |      |     |     |
|      |       |      |   |     |        |      |      |     |     |
|      |       |      |   |     |        |      |      |     |     |
|      |       |      |   |     |        |      |      |     |     |

Fonte  
GG(G)

|      |      |      |   |     |        |      |       |    |     |
|------|------|------|---|-----|--------|------|-------|----|-----|
| M 4  | 3.00 | 0.50 | 3 | 120 | 0.0070 | 9.4  | 12735 | 66 | 265 |
| M 5  | 4.00 | 0.50 | 3 | 120 | 0.0090 | 11.4 | 9550  | 52 | 260 |
| M 6  | 4.80 | 0.50 | 3 | 120 | 0.0110 | 13.6 | 7960  | 53 | 265 |
| M 6  | 4.80 | 0.75 | 3 | 120 | 0.0110 | 13.9 | 7960  | 53 | 265 |
| M 8  | 6.40 | 0.75 | 3 | 120 | 0.0145 | 17.9 | 5970  | 52 | 260 |
| M 8  | 6.40 | 1.00 | 3 | 120 | 0.0145 | 18.5 | 5970  | 52 | 260 |
| M 10 | 7.95 | 1.00 | 4 | 120 | 0.0180 | 22.8 | 4805  | 71 | 345 |
| M 10 | 7.95 | 1.25 | 4 | 120 | 0.0180 | 23.2 | 4805  | 71 | 345 |
| M 12 | 9.95 | 1.00 | 4 | 120 | 0.0225 | 26.8 | 3840  | 59 | 345 |

Fonte  
GG(G)

|      |       |      |   |     |        |      |      |    |     |
|------|-------|------|---|-----|--------|------|------|----|-----|
| M 12 | 9.95  | 1.50 | 4 | 120 | 0.0225 | 27.6 | 3840 | 59 | 345 |
| M 14 | 11.20 | 1.50 | 4 | 120 | 0.0250 | 32.6 | 3410 | 68 | 340 |
| M 16 | 12.80 | 1.50 | 4 | 120 | 0.0290 | 35.8 | 2985 | 69 | 345 |
|      |       |      |   |     |        |      |      |    |     |
|      |       |      |   |     |        |      |      |    |     |
|      |       |      |   |     |        |      |      |    |     |
|      |       |      |   |     |        |      |      |    |     |

# Fraises à fileter

2.0xd, chanfrein à 45°, Incool

MF

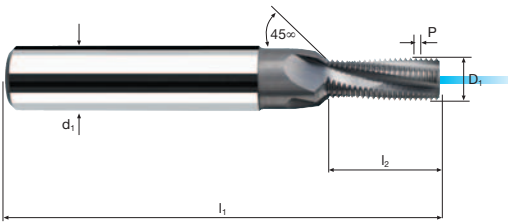


HM









Rm< 850

Rm850-1100

Rm1100-1300

Rm1300-1500

InoxStainless

TiTitanium

AluminiumGG(G)

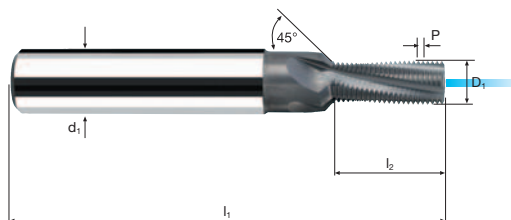
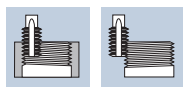
| Exemple: N° d'article Code-ø<br>N° cde <b>EH24320 .046</b> |     |      |     |      |          |       |          |                                                                                   | TiCN           |   |
|------------------------------------------------------------|-----|------|-----|------|----------|-------|----------|-----------------------------------------------------------------------------------|----------------|---|
|                                                            |     |      |     |      |          |       |          |                                                                                   | <b>EH24320</b> |   |
| Ø<br>Code                                                  | d   | P    | l1  | l2   | d1<br>h6 | D1    | Rk<br>6H |  |                |   |
| .046                                                       | M 4 | 0.50 | 48  | 8.8  | 6        | 3.00  | 1.475    | 3                                                                                 |                | ● |
| .048                                                       | M 5 | 0.50 | 54  | 10.8 | 6        | 4.00  | 1.975    | 3                                                                                 |                | ● |
| .050                                                       | M 6 | 0.50 | 62  | 12.8 | 8        | 4.80  | 2.375    | 3                                                                                 |                | ● |
| .064                                                       | M 6 | 0.75 | 62  | 13.1 | 8        | 4.80  | 2.363    | 3                                                                                 |                | ● |
| .066                                                       | M 8 | 0.75 | 74  | 16.9 | 10       | 6.40  | 3.163    | 3                                                                                 |                | ● |
| .090                                                       | M 8 | 1.00 | 74  | 17.5 | 10       | 6.40  | 3.150    | 3                                                                                 |                | ● |
| .092                                                       | M10 | 1.00 | 80  | 21.5 | 12       | 7.95  | 3.925    | 4                                                                                 |                | ● |
| .162                                                       | M10 | 1.25 | 80  | 21.9 | 12       | 7.95  | 3.913    | 4                                                                                 |                | ● |
| .094                                                       | M12 | 1.00 | 90  | 25.5 | 14       | 9.95  | 4.925    | 4                                                                                 |                | ● |
| .176                                                       | M12 | 1.50 | 90  | 26.3 | 14       | 9.95  | 4.900    | 4                                                                                 |                | ● |
| .178                                                       | M14 | 1.50 | 102 | 30.8 | 16       | 11.20 | 5.525    | 4                                                                                 |                | ● |
| .180                                                       | M16 | 1.50 | 102 | 33.8 | 18       | 12.80 | 6.325    | 4                                                                                 |                | ● |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |
|                                                            |     |      |     |      |          |       |          |                                                                                   |                |   |

TM

| Application                                                                       | Matières                                | G     | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f<sub>c</sub></sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|-----------------------------------------------------------------------------------|-----------------------------------------|-------|------------|------------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------------------|----------------------------|
|  | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | G 1/8 | 7.95       | 28         | 4 | 80                        | 0.0180                 | 22.4                   | 3205                     | 42                                     | 230                        |
|                                                                                   |                                         | G 1/4 | 10.50      | 19         | 4 | 80                        | 0.0240                 | 30.4                   | 2425                     | 47                                     | 235                        |
|                                                                                   |                                         | G 3/8 | 13.60      | 19         | 4 | 80                        | 0.0310                 | 37.3                   | 1870                     | 42                                     | 230                        |
|                                                                                   |                                         |       |            |            |   |                           |                        |                        |                          |                                        |                            |
|                                                                                   | Aciers<br>1300 - 1500 N/mm <sup>2</sup> | G 1/8 | 7.95       | 28         | 4 | 50                        | 0.0160                 | 22.4                   | 2000                     | 24                                     | 130                        |
|                                                                                   |                                         | G 1/4 | 10.50      | 19         | 4 | 50                        | 0.0210                 | 30.4                   | 1515                     | 25                                     | 125                        |
|                                                                                   |                                         | G 3/8 | 13.60      | 19         | 4 | 50                        | 0.0275                 | 37.3                   | 1170                     | 24                                     | 130                        |
|                                                                                   |                                         |       |            |            |   |                           |                        |                        |                          |                                        |                            |
|                                                                                   | Aciers à outil trempés<br>48 - 52 HRC   | G 1/8 | 7.95       | 28         | 4 | 30                        | 0.0120                 | 22.4                   | 1200                     | 11                                     | 60                         |
|                                                                                   |                                         | G 1/4 | 10.50      | 19         | 4 | 30                        | 0.0160                 | 30.4                   | 910                      | 12                                     | 60                         |
|                                                                                   |                                         | G 3/8 | 13.60      | 19         | 4 | 30                        | 0.0205                 | 37.3                   | 700                      | 10                                     | 55                         |
|                                                                                   |                                         |       |            |            |   |                           |                        |                        |                          |                                        |                            |
|                                                                                   | Aciers inoxydables<br>[Cr-Ni/1.4301]    | G 1/8 | 7.95       | 28         | 4 | 50                        | 0.0120                 | 22.4                   | 2000                     | 17                                     | 95                         |
|                                                                                   |                                         | G 1/4 | 10.50      | 19         | 4 | 50                        | 0.0160                 | 30.4                   | 1515                     | 19                                     | 95                         |
|                                                                                   |                                         | G 3/8 | 13.60      | 19         | 4 | 50                        | 0.0205                 | 37.3                   | 1170                     | 17                                     | 95                         |
|                                                                                   |                                         |       |            |            |   |                           |                        |                        |                          |                                        |                            |

| Matières                                        | G     | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f<sub>c</sub></sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|-------------------------------------------------|-------|------------|------------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------------------|----------------------------|
| Fonte<br>GG(G)                                  | G 1/8 | 7.95       | 28         | 4 | 120                       | 0.0180                 | 22.4                   | 4805                     | 63                                     | 345                        |
|                                                 | G 1/4 | 10.50      | 19         | 4 | 120                       | 0.0240                 | 30.4                   | 3640                     | 71                                     | 350                        |
|                                                 | G 3/8 | 13.60      | 19         | 4 | 120                       | 0.0310                 | 37.3                   | 2810                     | 64                                     | 350                        |
|                                                 |       |            |            |   |                           |                        |                        |                          |                                        |                            |
| Aluminium corroyé<br>Si < 6%                    | G 1/8 | 7.95       | 28         | 4 | 150                       | 0.0250                 | 22.4                   | 6005                     | 110                                    | 600                        |
|                                                 | G 1/4 | 10.50      | 19         | 4 | 150                       | 0.0335                 | 30.4                   | 4545                     | 123                                    | 610                        |
|                                                 | G 3/8 | 13.60      | 19         | 4 | 150                       | 0.0430                 | 37.3                   | 3510                     | 111                                    | 605                        |
|                                                 |       |            |            |   |                           |                        |                        |                          |                                        |                            |
| Fonte d'aluminium                               | G 1/8 | 7.95       | 28         | 4 | 200                       | 0.0250                 | 22.4                   | 8010                     | 146                                    | 800                        |
|                                                 | G 1/4 | 10.50      | 19         | 4 | 200                       | 0.0335                 | 30.4                   | 6065                     | 165                                    | 815                        |
|                                                 | G 3/8 | 13.60      | 19         | 4 | 200                       | 0.0430                 | 37.3                   | 4680                     | 148                                    | 805                        |
|                                                 |       |            |            |   |                           |                        |                        |                          |                                        |                            |
| Titanes alliés trempés<br>> 300 HB<br>[Ti6Al4V] | G 1/8 | 7.95       | 28         | 4 | 40                        | 0.0120                 | 22.4                   | 1600                     | 14                                     | 75                         |
|                                                 | G 1/4 | 10.50      | 19         | 4 | 40                        | 0.0160                 | 30.4                   | 1215                     | 16                                     | 80                         |
|                                                 | G 3/8 | 13.60      | 19         | 4 | 40                        | 0.0205                 | 37.3                   | 935                      | 14                                     | 75                         |
|                                                 |       |            |            |   |                           |                        |                        |                          |                                        |                            |

2.0xd, chanfrein à 45°, Incool



|                    |                       |                        |                        |                     |  |  |                          |                       |                           |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Aluminium</b><br>GG(G) |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|

[illegible]

## Application



## Matières

Aciers  
850 - 1100 N/mm²

| UNC  | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|------------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------|----------------------------|
| 1/4  | 4.80       | 20         | 3 | 80                        | 0.0110                 | 15.5                   | 5305                     | 43                         | 175                        |
| 5/16 | 5.95       | 18         | 3 | 80                        | 0.0135                 | 18.8                   | 4280                     | 44                         | 175                        |
| 3/8  | 7.10       | 16         | 4 | 80                        | 0.0160                 | 22.9                   | 3585                     | 59                         | 230                        |
| 7/16 | 7.95       | 14         | 4 | 80                        | 0.0180                 | 26.4                   | 3205                     | 65                         | 230                        |
| 1/2  | 9.95       | 13         | 4 | 80                        | 0.0225                 | 30.0                   | 2560                     | 50                         | 230                        |
|      |            |            |   |                           |                        |                        |                          |                            |                            |
|      |            |            |   |                           |                        |                        |                          |                            |                            |
|      |            |            |   |                           |                        |                        |                          |                            |                            |

Aciers  
1300 - 1500 N/mm²

|      |      |    |   |    |        |      |      |    |     |
|------|------|----|---|----|--------|------|------|----|-----|
| 1/4  | 4.80 | 20 | 3 | 50 | 0.0095 | 15.5 | 3315 | 23 | 95  |
| 5/16 | 5.95 | 18 | 3 | 50 | 0.0120 | 18.8 | 2675 | 24 | 95  |
| 3/8  | 7.10 | 16 | 4 | 50 | 0.0145 | 22.9 | 2240 | 33 | 130 |
| 7/16 | 7.95 | 14 | 4 | 50 | 0.0160 | 26.4 | 2000 | 37 | 130 |
| 1/2  | 9.95 | 13 | 4 | 50 | 0.0200 | 30.0 | 1600 | 28 | 130 |
|      |      |    |   |    |        |      |      |    |     |
|      |      |    |   |    |        |      |      |    |     |
|      |      |    |   |    |        |      |      |    |     |

Aciers à outil trempés  
48 - 52 HRC

|      |      |    |   |    |        |      |      |    |    |
|------|------|----|---|----|--------|------|------|----|----|
| 1/4  | 4.80 | 20 | 3 | 30 | 0.0075 | 15.5 | 1990 | 11 | 45 |
| 5/16 | 5.95 | 18 | 3 | 30 | 0.0090 | 18.8 | 1605 | 11 | 45 |
| 3/8  | 7.10 | 16 | 4 | 30 | 0.0110 | 22.9 | 1345 | 15 | 60 |
| 7/16 | 7.95 | 14 | 4 | 30 | 0.0120 | 26.4 | 1200 | 17 | 60 |
| 1/2  | 9.95 | 13 | 4 | 30 | 0.0150 | 30.0 | 960  | 13 | 60 |
|      |      |    |   |    |        |      |      |    |    |
|      |      |    |   |    |        |      |      |    |    |
|      |      |    |   |    |        |      |      |    |    |

Aciers inoxydables  
[Cr-Ni/1.4301]

|      |      |    |   |    |        |      |      |    |     |
|------|------|----|---|----|--------|------|------|----|-----|
| 1/4  | 4.80 | 20 | 3 | 50 | 0.0075 | 15.5 | 3315 | 18 | 75  |
| 5/16 | 5.95 | 18 | 3 | 50 | 0.0090 | 18.8 | 2675 | 18 | 70  |
| 3/8  | 7.10 | 16 | 4 | 50 | 0.0110 | 22.9 | 2240 | 25 | 100 |
| 7/16 | 7.95 | 14 | 4 | 50 | 0.0120 | 26.4 | 2000 | 27 | 95  |
| 1/2  | 9.95 | 13 | 4 | 50 | 0.0150 | 30.0 | 1600 | 21 | 95  |
|      |      |    |   |    |        |      |      |    |     |
|      |      |    |   |    |        |      |      |    |     |
|      |      |    |   |    |        |      |      |    |     |

## Matières

Fonte  
GG(G)

| UNC  | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>f</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|------------|---|---------------------------|------------------------|------------------------|--------------------------|----------------------------|----------------------------|
| 1/4  | 4.80       | 20         | 3 | 120                       | 0.0110                 | 15.5                   | 7960                     | 65                         | 265                        |
| 5/16 | 5.95       | 18         | 3 | 120                       | 0.0135                 | 18.8                   | 6420                     | 65                         | 260                        |
| 3/8  | 7.10       | 16         | 4 | 120                       | 0.0160                 | 22.9                   | 5380                     | 88                         | 345                        |
| 7/16 | 7.95       | 14         | 4 | 120                       | 0.0180                 | 26.4                   | 4805                     | 98                         | 345                        |
| 1/2  | 9.95       | 13         | 4 | 120                       | 0.0225                 | 30.0                   | 3840                     | 75                         | 345                        |
|      |            |            |   |                           |                        |                        |                          |                            |                            |
|      |            |            |   |                           |                        |                        |                          |                            |                            |
|      |            |            |   |                           |                        |                        |                          |                            |                            |

Aluminium corroyé  
Si < 6%

|      |      |    |   |     |        |      |      |     |     |
|------|------|----|---|-----|--------|------|------|-----|-----|
| 1/4  | 4.80 | 20 | 3 | 150 | 0.0150 | 15.5 | 9945 | 110 | 450 |
| 5/16 | 5.95 | 18 | 3 | 150 | 0.0190 | 18.8 | 8025 | 114 | 455 |
| 3/8  | 7.10 | 16 | 4 | 150 | 0.0225 | 22.9 | 6725 | 154 | 605 |
| 7/16 | 7.95 | 14 | 4 | 150 | 0.0250 | 26.4 | 6005 | 171 | 600 |
| 1/2  | 9.95 | 13 | 4 | 150 | 0.0315 | 30.0 | 4800 | 131 | 605 |
|      |      |    |   |     |        |      |      |     |     |
|      |      |    |   |     |        |      |      |     |     |
|      |      |    |   |     |        |      |      |     |     |

Fonte d'aluminium

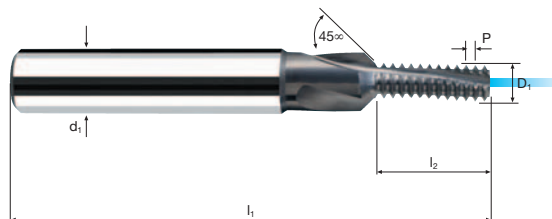
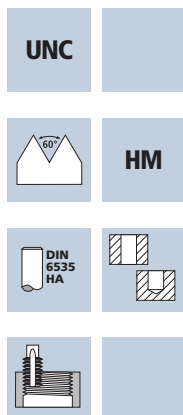
|      |      |    |   |     |        |      |       |     |     |
|------|------|----|---|-----|--------|------|-------|-----|-----|
| 1/4  | 4.80 | 20 | 3 | 200 | 0.0150 | 15.5 | 13265 | 145 | 595 |
| 5/16 | 5.95 | 18 | 3 | 200 | 0.0190 | 18.8 | 10700 | 153 | 610 |
| 3/8  | 7.10 | 16 | 4 | 200 | 0.0225 | 22.9 | 8965  | 205 | 805 |
| 7/16 | 7.95 | 14 | 4 | 200 | 0.0250 | 26.4 | 8010  | 228 | 800 |
| 1/2  | 9.95 | 13 | 4 | 200 | 0.0315 | 30.0 | 6400  | 174 | 805 |
|      |      |    |   |     |        |      |       |     |     |
|      |      |    |   |     |        |      |       |     |     |
|      |      |    |   |     |        |      |       |     |     |

Titanes alliés trempés  
> 300 HB  
[Ti6Al4V]

|      |      |    |   |    |        |      |      |    |    |
|------|------|----|---|----|--------|------|------|----|----|
| 1/4  | 4.80 | 20 | 3 | 40 | 0.0075 | 15.5 | 2655 | 15 | 60 |
| 5/16 | 5.95 | 18 | 3 | 40 | 0.0090 | 18.8 | 2140 | 15 | 60 |
| 3/8  | 7.10 | 16 | 4 | 40 | 0.0110 | 22.9 | 1795 | 20 | 80 |
| 7/16 | 7.95 | 14 | 4 | 40 | 0.0120 | 26.4 | 1600 | 21 | 75 |
| 1/2  | 9.95 | 13 | 4 | 40 | 0.0150 | 30.0 | 1280 | 16 | 75 |
|      |      |    |   |    |        |      |      |    |    |
|      |      |    |   |    |        |      |      |    |    |
|      |      |    |   |    |        |      |      |    |    |



2.0xd, chanfrein à 45°, Incool



|                    |                       |                        |                        |                     |  |  |                          |                       |                           |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Aluminium</b><br>GG(G) |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|

[illegible]

## Application



## Matières

Aciers  
850 - 1100 N/mm²

| UNF  | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>fc</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|------------|---|---------------------------|------------------------|------------------------|--------------------------|-----------------------------|----------------------------|
| 1/4  | 4.80       | 28         | 3 | 80                        | 0.0110                 | 15.0                   | 5305                     | 43                          | 175                        |
| 5/16 | 5.95       | 24         | 3 | 80                        | 0.0135                 | 18.7                   | 4280                     | 44                          | 175                        |
| 3/8  | 7.95       | 24         | 4 | 80                        | 0.0180                 | 21.6                   | 3205                     | 38                          | 230                        |
| 7/16 | 7.95       | 20         | 4 | 80                        | 0.0180                 | 26.7                   | 3205                     | 65                          | 230                        |
| 1/2  | 9.95       | 20         | 4 | 80                        | 0.0225                 | 29.0                   | 2560                     | 50                          | 230                        |
|      |            |            |   |                           |                        |                        |                          |                             |                            |
|      |            |            |   |                           |                        |                        |                          |                             |                            |
|      |            |            |   |                           |                        |                        |                          |                             |                            |

Aciers  
1300 - 1500 N/mm²

|      |      |    |   |    |        |      |      |    |     |
|------|------|----|---|----|--------|------|------|----|-----|
| 1/4  | 4.80 | 28 | 3 | 50 | 0.0095 | 15.0 | 3315 | 23 | 95  |
| 5/16 | 5.95 | 24 | 3 | 50 | 0.0120 | 18.7 | 2675 | 24 | 95  |
| 3/8  | 7.95 | 24 | 4 | 50 | 0.0160 | 21.6 | 2000 | 21 | 130 |
| 7/16 | 7.95 | 20 | 4 | 50 | 0.0160 | 26.7 | 2000 | 37 | 130 |
| 1/2  | 9.95 | 20 | 4 | 50 | 0.0200 | 29.0 | 1600 | 28 | 130 |
|      |      |    |   |    |        |      |      |    |     |
|      |      |    |   |    |        |      |      |    |     |
|      |      |    |   |    |        |      |      |    |     |

Aciers à outil trempés  
48 - 52 HRC

|      |      |    |   |    |        |      |      |    |    |
|------|------|----|---|----|--------|------|------|----|----|
| 1/4  | 4.80 | 28 | 3 | 30 | 0.0075 | 15.0 | 1990 | 11 | 45 |
| 5/16 | 5.95 | 24 | 3 | 30 | 0.0090 | 18.7 | 1605 | 11 | 45 |
| 3/8  | 7.95 | 24 | 4 | 30 | 0.0120 | 21.6 | 1200 | 10 | 60 |
| 7/16 | 7.95 | 20 | 4 | 30 | 0.0120 | 26.7 | 1200 | 17 | 60 |
| 1/2  | 9.95 | 20 | 4 | 30 | 0.0150 | 29.0 | 960  | 13 | 60 |
|      |      |    |   |    |        |      |      |    |    |
|      |      |    |   |    |        |      |      |    |    |
|      |      |    |   |    |        |      |      |    |    |

Aciers inoxydables  
[Cr-Ni/1.4301]

|      |      |    |   |    |        |      |      |    |    |
|------|------|----|---|----|--------|------|------|----|----|
| 1/4  | 4.80 | 28 | 3 | 50 | 0.0075 | 15.0 | 3315 | 18 | 75 |
| 5/16 | 5.95 | 24 | 3 | 50 | 0.0090 | 18.7 | 2675 | 18 | 70 |
| 3/8  | 7.95 | 24 | 4 | 50 | 0.0120 | 21.6 | 2000 | 16 | 95 |
| 7/16 | 7.95 | 20 | 4 | 50 | 0.0120 | 26.7 | 2000 | 27 | 95 |
| 1/2  | 9.95 | 20 | 4 | 50 | 0.0150 | 29.0 | 1600 | 21 | 95 |
|      |      |    |   |    |        |      |      |    |    |
|      |      |    |   |    |        |      |      |    |    |
|      |      |    |   |    |        |      |      |    |    |

## Matières

Fonte  
GG(G)

| UNF  | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | L <sub>K</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>fc</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------|------------|------------|---|---------------------------|------------------------|------------------------|--------------------------|-----------------------------|----------------------------|
| 1/4  | 4.80       | 28         | 3 | 120                       | 0.0110                 | 15.0                   | 7960                     | 65                          | 265                        |
| 5/16 | 5.95       | 24         | 3 | 120                       | 0.0135                 | 18.7                   | 6420                     | 65                          | 260                        |
| 3/8  | 7.95       | 24         | 4 | 120                       | 0.0180                 | 21.6                   | 4805                     | 57                          | 345                        |
| 7/16 | 7.95       | 20         | 4 | 120                       | 0.0180                 | 26.7                   | 4805                     | 98                          | 345                        |
| 1/2  | 9.95       | 20         | 4 | 120                       | 0.0225                 | 29.0                   | 3840                     | 75                          | 345                        |
|      |            |            |   |                           |                        |                        |                          |                             |                            |
|      |            |            |   |                           |                        |                        |                          |                             |                            |
|      |            |            |   |                           |                        |                        |                          |                             |                            |

Aluminium corroyé  
Si < 6%

|      |      |    |   |     |        |      |      |     |     |
|------|------|----|---|-----|--------|------|------|-----|-----|
| 1/4  | 4.80 | 28 | 3 | 150 | 0.0150 | 15.0 | 9945 | 110 | 450 |
| 5/16 | 5.95 | 24 | 3 | 150 | 0.0190 | 18.7 | 8025 | 114 | 455 |
| 3/8  | 7.95 | 24 | 4 | 150 | 0.0250 | 21.6 | 6005 | 99  | 600 |
| 7/16 | 7.95 | 20 | 4 | 150 | 0.0250 | 26.7 | 6005 | 171 | 600 |
| 1/2  | 9.95 | 20 | 4 | 150 | 0.0315 | 29.0 | 4800 | 131 | 605 |
|      |      |    |   |     |        |      |      |     |     |
|      |      |    |   |     |        |      |      |     |     |
|      |      |    |   |     |        |      |      |     |     |

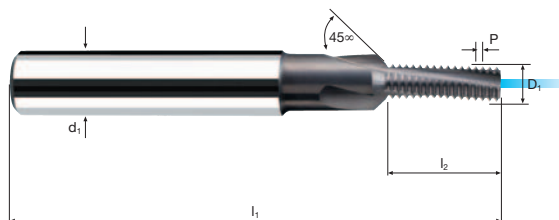
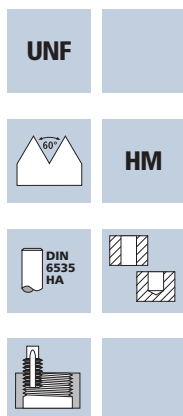
Fonte d'aluminium

|      |      |    |   |     |        |      |       |     |     |
|------|------|----|---|-----|--------|------|-------|-----|-----|
| 1/4  | 4.80 | 28 | 3 | 200 | 0.0150 | 15.0 | 13265 | 145 | 595 |
| 5/16 | 5.95 | 24 | 3 | 200 | 0.0190 | 18.7 | 10700 | 153 | 610 |
| 3/8  | 7.95 | 24 | 4 | 200 | 0.0250 | 21.6 | 8010  | 132 | 800 |
| 7/16 | 7.95 | 20 | 4 | 200 | 0.0250 | 26.7 | 8010  | 228 | 800 |
| 1/2  | 9.95 | 20 | 4 | 200 | 0.0315 | 29.0 | 6400  | 174 | 805 |
|      |      |    |   |     |        |      |       |     |     |
|      |      |    |   |     |        |      |       |     |     |
|      |      |    |   |     |        |      |       |     |     |

Titanes alliés trempés  
> 300 HB  
[Ti6Al4V]

|      |      |    |   |    |        |      |      |    |    |
|------|------|----|---|----|--------|------|------|----|----|
| 1/4  | 4.80 | 28 | 3 | 40 | 0.0075 | 15.0 | 2655 | 15 | 60 |
| 5/16 | 5.95 | 24 | 3 | 40 | 0.0090 | 18.7 | 2140 | 15 | 60 |
| 3/8  | 7.95 | 24 | 4 | 40 | 0.0120 | 21.6 | 1600 | 12 | 75 |
| 7/16 | 7.95 | 20 | 4 | 40 | 0.0120 | 26.7 | 1600 | 21 | 75 |
| 1/2  | 9.95 | 20 | 4 | 40 | 0.0150 | 29.0 | 1280 | 16 | 75 |
|      |      |    |   |    |        |      |      |    |    |
|      |      |    |   |    |        |      |      |    |    |
|      |      |    |   |    |        |      |      |    |    |

2.0xd, chanfrein à 45°, Incool



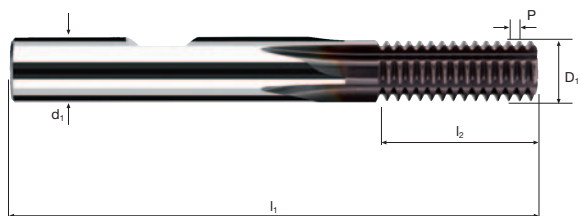
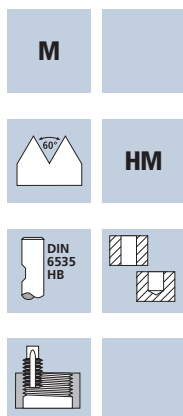
|                    |                       |                        |                        |                     |  |  |                          |                       |                           |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Aluminium</b><br>GG(G) |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|

[illegible]

| Application                                                                      | Matières                                | M     | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>fc</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|----------------------------------------------------------------------------------|-----------------------------------------|-------|------------|-----------|---|---------------------------|------------------------|--------------------------|-----------------------------|----------------------------|
|  | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | M 1.6 | 1.00       | 0.35      | 3 | 30                        | 0.0015                 | 9550                     | 17                          | 45                         |
|                                                                                  |                                         | M 2   | 1.30       | 0.40      | 3 | 30                        | 0.0020                 | 7345                     | 16                          | 45                         |
|                                                                                  |                                         | M 2.5 | 1.50       | 0.45      | 3 | 30                        | 0.0025                 | 6365                     | 20                          | 50                         |
|                                                                                  |                                         | M 3   | 2.10       | 0.50      | 3 | 30                        | 0.0035                 | 4545                     | 15                          | 50                         |
|                                                                                  |                                         | M 4   | 2.60       | 0.70      | 3 | 30                        | 0.0065                 | 3675                     | 25                          | 70                         |
|                                                                                  |                                         | M 5   | 3.60       | 0.80      | 3 | 30                        | 0.0090                 | 2655                     | 20                          | 70                         |
|                                                                                  |                                         | M 6   | 4.00       | 1.00      | 3 | 30                        | 0.0100                 | 2385                     | 23                          | 70                         |
|                                                                                  |                                         | M 8   | 5.00       | 1.25      | 3 | 30                        | 0.0125                 | 1910                     | 26                          | 70                         |
|                                                                                  |                                         | M 10  | 5.90       | 1.50      | 5 | 30                        | 0.0150                 | 1620                     | 49                          | 120                        |
|                                                                                  |                                         | M 12  | 7.90       | 1.75      | 5 | 30                        | 0.0200                 | 1210                     | 41                          | 120                        |
|                                                                                  | Aciers<br>850 - 1100 N/mm <sup>2</sup>  | M 16  | 9.90       | 2.00      | 5 | 30                        | 0.0250                 | 965                      | 46                          | 120                        |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  | Aciers<br>1100 - 1300 N/mm <sup>2</sup> | M 1.6 | 1.00       | 0.35      | 3 | 20                        | 0.0015                 | 6365                     | 11                          | 30                         |
|                                                                                  |                                         | M 2   | 1.30       | 0.40      | 3 | 20                        | 0.0020                 | 4895                     | 11                          | 30                         |
|                                                                                  |                                         | M 2.5 | 1.50       | 0.45      | 3 | 20                        | 0.0025                 | 4245                     | 12                          | 30                         |
|                                                                                  |                                         | M 3   | 2.10       | 0.50      | 3 | 20                        | 0.0035                 | 3030                     | 9                           | 30                         |
|                                                                                  |                                         | M 4   | 2.60       | 0.70      | 3 | 20                        | 0.0065                 | 2450                     | 18                          | 50                         |
|                                                                                  |                                         | M 5   | 3.60       | 0.80      | 3 | 20                        | 0.0090                 | 1770                     | 14                          | 50                         |
|                                                                                  |                                         | M 6   | 4.00       | 1.00      | 3 | 20                        | 0.0100                 | 1590                     | 17                          | 50                         |
|                                                                                  |                                         | M 8   | 5.00       | 1.25      | 3 | 20                        | 0.0125                 | 1275                     | 19                          | 50                         |
|                                                                                  |                                         | M 10  | 5.90       | 1.50      | 5 | 20                        | 0.0150                 | 1080                     | 33                          | 80                         |
|                                                                                  |                                         | M 12  | 7.90       | 1.75      | 5 | 20                        | 0.0200                 | 805                      | 27                          | 80                         |
|                                                                                  | Aciers<br>1100 - 1300 N/mm <sup>2</sup> | M 16  | 9.90       | 2.00      | 5 | 20                        | 0.0250                 | 645                      | 31                          | 80                         |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |
|                                                                                  |                                         |       |            |           |   |                           |                        |                          |                             |                            |

| Matières                     | M     | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>fc</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|------------------------------|-------|------------|-----------|---|---------------------------|------------------------|--------------------------|-----------------------------|----------------------------|
| Aluminium corroyé<br>Si < 6% | M 1.6 | 1.00       | 0.35      | 3 | 60                        | 0.0015                 | 19100                    | 32                          | 85                         |
|                              | M 2   | 1.30       | 0.40      | 3 | 60                        | 0.0020                 | 14690                    | 32                          | 90                         |
|                              | M 2.5 | 1.50       | 0.45      | 3 | 60                        | 0.0025                 | 12735                    | 38                          | 95                         |
|                              | M 3   | 2.10       | 0.50      | 3 | 60                        | 0.0035                 | 9095                     | 29                          | 95                         |
|                              | M 4   | 2.60       | 0.70      | 3 | 60                        | 0.0065                 | 7345                     | 51                          | 145                        |
|                              | M 5   | 3.60       | 0.80      | 3 | 60                        | 0.0090                 | 5305                     | 41                          | 145                        |
|                              | M 6   | 4.00       | 1.00      | 3 | 60                        | 0.0100                 | 4775                     | 48                          | 145                        |
|                              | M 8   | 5.00       | 1.25      | 3 | 60                        | 0.0125                 | 3820                     | 54                          | 145                        |
|                              | M 10  | 5.90       | 1.50      | 5 | 60                        | 0.0150                 | 3235                     | 100                         | 245                        |
|                              | M 12  | 7.90       | 1.75      | 5 | 60                        | 0.0200                 | 2420                     | 82                          | 240                        |
|                              | M 16  | 9.90       | 2.00      | 5 | 60                        | 0.0250                 | 1930                     | 92                          | 240                        |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
| Fonte<br>GG(G)               | M 1.6 | 1.00       | 0.35      | 3 | 50                        | 0.0015                 | 15915                    | 26                          | 70                         |
|                              | M 2   | 1.30       | 0.40      | 3 | 50                        | 0.0020                 | 12245                    | 26                          | 75                         |
|                              | M 2.5 | 1.50       | 0.45      | 3 | 50                        | 0.0025                 | 10610                    | 32                          | 80                         |
|                              | M 3   | 2.10       | 0.50      | 3 | 50                        | 0.0035                 | 7580                     | 24                          | 80                         |
|                              | M 4   | 2.60       | 0.70      | 3 | 50                        | 0.0065                 | 6120                     | 42                          | 120                        |
|                              | M 5   | 3.60       | 0.80      | 3 | 50                        | 0.0090                 | 4420                     | 34                          | 120                        |
|                              | M 6   | 4.00       | 1.00      | 3 | 50                        | 0.0100                 | 3980                     | 40                          | 120                        |
|                              | M 8   | 5.00       | 1.25      | 3 | 50                        | 0.0125                 | 3185                     | 45                          | 120                        |
|                              | M 10  | 5.90       | 1.50      | 5 | 50                        | 0.0150                 | 2700                     | 84                          | 205                        |
|                              | M 12  | 7.90       | 1.75      | 5 | 50                        | 0.0200                 | 2015                     | 68                          | 200                        |
|                              | M 16  | 9.90       | 2.00      | 5 | 50                        | 0.0250                 | 1610                     | 76                          | 200                        |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |
|                              |       |            |           |   |                           |                        |                          |                             |                            |

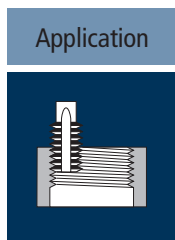
1.5xd



|                    |                       |                        |                        |  |  |  |                          |                       |                           |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|-----------------------|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 |  |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Aluminium</b><br>GG(G) |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|-----------------------|---------------------------|

[illegible]

TM



## Application

## Matières

Aciers  
< 850 N/mm²

| G          | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>fc</sub><br>dD1<br>3/2 | v <sub>fc</sub><br>dD1<br>2/1 | v <sub>fc</sub><br>dD1<br>3/1 | v <sub>fc</sub><br>dD1<br>4/1 | v <sub>fc</sub><br>dD1<br>> 5/1 | v <sub>f</sub><br>[mm/min] |
|------------|------------|------------|---|---------------------------|------------------------|---------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|----------------------------|
| G1/16-G1/8 | 5.90       | 28         | 5 | 30                        | 0.0150                 | 1620                      | 40                            | 60                            | 80                            | 90                            | 96                              | 120                        |
| G1/4 -G3/8 | 7.90       | 19         | 5 | 30                        | 0.0200                 | 1210                      | 40                            | 60                            | 80                            | 90                            | 96                              | 120                        |
| G1/2 -G7/8 | 11.90      | 14         | 5 | 30                        | 0.0300                 | 800                       | 40                            | 60                            | 80                            | 90                            | 96                              | 120                        |
| G1 -G3     | 15.90      | 11         | 5 | 30                        | 0.0400                 | 600                       | 40                            | 60                            | 80                            | 90                            | 96                              | 120                        |
|            |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|            |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|            |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|            |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |

Aciers  
850 - 1100 N/mm²

|            |       |    |   |    |        |      |    |    |    |    |    |    |
|------------|-------|----|---|----|--------|------|----|----|----|----|----|----|
| G1/16-G1/8 | 5.90  | 28 | 5 | 20 | 0.0150 | 1080 | 27 | 40 | 53 | 60 | 64 | 80 |
| G1/4 -G3/8 | 7.90  | 19 | 5 | 20 | 0.0200 | 805  | 27 | 40 | 53 | 60 | 64 | 80 |
| G1/2 -G7/8 | 11.90 | 14 | 5 | 20 | 0.0300 | 535  | 27 | 40 | 53 | 60 | 64 | 80 |
| G1 -G3     | 15.90 | 11 | 5 | 20 | 0.0400 | 400  | 27 | 40 | 53 | 60 | 64 | 80 |
|            |       |    |   |    |        |      |    |    |    |    |    |    |
|            |       |    |   |    |        |      |    |    |    |    |    |    |
|            |       |    |   |    |        |      |    |    |    |    |    |    |
|            |       |    |   |    |        |      |    |    |    |    |    |    |

Aciers inoxydables  
[Cr-Ni/1.4301]

|            |       |    |   |    |        |      |    |    |    |    |    |    |
|------------|-------|----|---|----|--------|------|----|----|----|----|----|----|
| G1/16-G1/8 | 5.90  | 28 | 5 | 25 | 0.0100 | 1350 | 23 | 35 | 47 | 53 | 56 | 70 |
| G1/4 -G3/8 | 7.90  | 19 | 5 | 25 | 0.0130 | 1005 | 22 | 33 | 43 | 49 | 52 | 65 |
| G1/2 -G7/8 | 11.90 | 14 | 5 | 25 | 0.0200 | 670  | 22 | 33 | 43 | 49 | 52 | 65 |
| G1 -G3     | 15.90 | 11 | 5 | 25 | 0.0265 | 500  | 22 | 33 | 43 | 49 | 52 | 65 |
|            |       |    |   |    |        |      |    |    |    |    |    |    |
|            |       |    |   |    |        |      |    |    |    |    |    |    |
|            |       |    |   |    |        |      |    |    |    |    |    |    |
|            |       |    |   |    |        |      |    |    |    |    |    |    |

Fonte  
GG(G)

|            |       |    |   |    |        |      |    |     |     |     |     |     |
|------------|-------|----|---|----|--------|------|----|-----|-----|-----|-----|-----|
| G1/16-G1/8 | 5.90  | 28 | 5 | 50 | 0.0150 | 2700 | 68 | 103 | 137 | 154 | 164 | 205 |
| G1/4 -G3/8 | 7.90  | 19 | 5 | 50 | 0.0200 | 2015 | 67 | 100 | 133 | 150 | 160 | 200 |
| G1/2 -G7/8 | 11.90 | 14 | 5 | 50 | 0.0300 | 1335 | 67 | 100 | 133 | 150 | 160 | 200 |
| G1 -G3     | 15.90 | 11 | 5 | 50 | 0.0400 | 1000 | 67 | 100 | 133 | 150 | 160 | 200 |
|            |       |    |   |    |        |      |    |     |     |     |     |     |
|            |       |    |   |    |        |      |    |     |     |     |     |     |
|            |       |    |   |    |        |      |    |     |     |     |     |     |
|            |       |    |   |    |        |      |    |     |     |     |     |     |

## Matières

Aluminium corroyé  
Si < 6%

| G          | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>fc</sub><br>dD1<br>3/2 | v <sub>fc</sub><br>dD1<br>2/1 | v <sub>fc</sub><br>dD1<br>3/1 | v <sub>fc</sub><br>dD1<br>4/1 | v <sub>fc</sub><br>dD1<br>> 5/1 | v <sub>f</sub><br>[mm/min] |
|------------|------------|------------|---|---------------------------|------------------------|---------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|----------------------------|
| G1/16-G1/8 | 5.90       | 28         | 5 | 60                        | 0.0150                 | 3235                      | 82                            | 123                           | 163                           | 184                           | 196                             | 245                        |
| G1/4 -G3/8 | 7.90       | 19         | 5 | 60                        | 0.0200                 | 2420                      | 80                            | 120                           | 160                           | 180                           | 192                             | 240                        |
| G1/2 -G7/8 | 11.90      | 14         | 5 | 60                        | 0.0300                 | 1605                      | 80                            | 120                           | 160                           | 180                           | 192                             | 240                        |
| G1 -G3     | 15.90      | 11         | 5 | 60                        | 0.0400                 | 1200                      | 80                            | 120                           | 160                           | 180                           | 192                             | 240                        |
|            |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|            |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|            |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|            |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |

Fonte d'aluminium

|            |       |    |   |    |        |      |     |     |     |     |     |     |
|------------|-------|----|---|----|--------|------|-----|-----|-----|-----|-----|-----|
| G1/16-G1/8 | 5.90  | 28 | 5 | 80 | 0.0150 | 4315 | 108 | 163 | 217 | 244 | 260 | 325 |
| G1/4 -G3/8 | 7.90  | 19 | 5 | 80 | 0.0200 | 3225 | 108 | 163 | 217 | 244 | 260 | 325 |
| G1/2 -G7/8 | 11.90 | 14 | 5 | 80 | 0.0300 | 2140 | 107 | 160 | 213 | 240 | 256 | 320 |
| G1 -G3     | 15.90 | 11 | 5 | 80 | 0.0400 | 1600 | 107 | 160 | 213 | 240 | 256 | 320 |
|            |       |    |   |    |        |      |     |     |     |     |     |     |
|            |       |    |   |    |        |      |     |     |     |     |     |     |
|            |       |    |   |    |        |      |     |     |     |     |     |     |
|            |       |    |   |    |        |      |     |     |     |     |     |     |

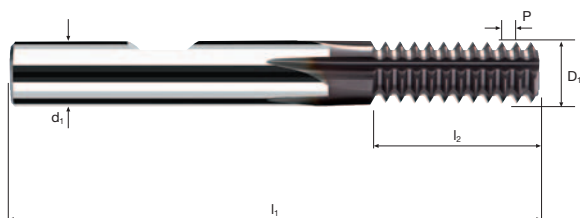
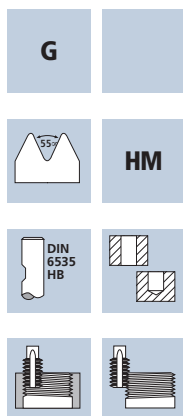
Cuivre non-allié

|            |       |    |   |    |        |      |    |     |     |     |     |     |
|------------|-------|----|---|----|--------|------|----|-----|-----|-----|-----|-----|
| G1/16-G1/8 | 5.90  | 28 | 5 | 70 | 0.0150 | 3775 | 95 | 143 | 190 | 214 | 228 | 285 |
| G1/4 -G3/8 | 7.90  | 19 | 5 | 70 | 0.0200 | 2820 | 93 | 140 | 187 | 210 | 224 | 280 |
| G1/2 -G7/8 | 11.90 | 14 | 5 | 70 | 0.0300 | 1870 | 93 | 140 | 187 | 210 | 224 | 280 |
| G1 -G3     | 15.90 | 11 | 5 | 70 | 0.0400 | 1400 | 93 | 140 | 187 | 210 | 224 | 280 |
|            |       |    |   |    |        |      |    |     |     |     |     |     |
|            |       |    |   |    |        |      |    |     |     |     |     |     |
|            |       |    |   |    |        |      |    |     |     |     |     |     |
|            |       |    |   |    |        |      |    |     |     |     |     |     |

Thermoplastiques

|            |       |    |   |     |        |      |     |     |     |     |     |     |
|------------|-------|----|---|-----|--------|------|-----|-----|-----|-----|-----|-----|
| G1/16-G1/8 | 5.90  | 28 | 5 | 100 | 0.0150 | 5395 | 135 | 203 | 270 | 304 | 324 | 405 |
| G1/4 -G3/8 | 7.90  | 19 | 5 | 100 | 0.0200 | 4030 | 135 | 203 | 270 | 304 | 324 | 405 |
| G1/2 -G7/8 | 11.90 | 14 | 5 | 100 | 0.0300 | 2675 | 133 | 200 | 267 | 300 | 320 | 400 |
| G1 -G3     | 15.90 | 11 | 5 | 100 | 0.0400 | 2000 | 133 | 200 | 267 | 300 | 320 | 400 |
|            |       |    |   |     |        |      |     |     |     |     |     |     |
|            |       |    |   |     |        |      |     |     |     |     |     |     |
|            |       |    |   |     |        |      |     |     |     |     |     |     |
|            |       |    |   |     |        |      |     |     |     |     |     |     |

1.5xd



|                    |                       |                        |  |  |  |  |                          |                       |                           |
|--------------------|-----------------------|------------------------|--|--|--|--|--------------------------|-----------------------|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 |  |  |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Aluminium</b><br>GG(G) |
|--------------------|-----------------------|------------------------|--|--|--|--|--------------------------|-----------------------|---------------------------|

[illegible]

## Application



A diagram showing a white rectangular block with a U-shaped clip attached to its top surface. The clip is a coiled spring that loops around the block and then extends horizontally to the right, ending in a hook-like shape. The background is dark blue.

# Matières

## Aciers < 850 N/mm<sup>2</sup>

Aciers  
< 850 N/mm<sup>2</sup>

| UNC  | UNF      | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>fc</sub><br>dD1<br>3/2 | v <sub>fc</sub><br>dD1<br>2/1 | v <sub>fc</sub><br>dD1<br>3/1 | v <sub>fc</sub><br>dD1<br>4/1 | v <sub>fc</sub><br>dD1<br>> 5/1 | v <sub>f</sub><br>[mm/min] |
|------|----------|------------|------------|---|---------------------------|------------------------|---------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|----------------------------|
| 2    | 3        | 1.50       | 56         | 3 | 30                        | 0.0025                 | 6365                      | 17                            | 25                            | 33                            | 38                            | 40                              | 50                         |
| 3    | 4        | 1.50       | 48         | 3 | 30                        | 0.0025                 | 6365                      | 17                            | 25                            | 33                            | 38                            | 40                              | 50                         |
| 4-5  | 6        | 2.10       | 40         | 3 | 30                        | 0.0035                 | 4545                      | 17                            | 25                            | 33                            | 38                            | 40                              | 50                         |
| 8    | 10       | 3.00       | 32         | 3 | 30                        | 0.0050                 | 3185                      | 17                            | 25                            | 33                            | 38                            | 40                              | 50                         |
| 12   | 5/16-3/8 | 4.00       | 24         | 3 | 30                        | 0.0065                 | 2385                      | 15                            | 23                            | 30                            | 34                            | 36                              | 45                         |
| 1/4  | 7/16-1/2 | 4.00       | 20         | 3 | 30                        | 0.0065                 | 2385                      | 15                            | 23                            | 30                            | 34                            | 36                              | 45                         |
| 5/16 | 9/16-5/8 | 5.00       | 18         | 3 | 30                        | 0.0085                 | 1910                      | 17                            | 25                            | 33                            | 38                            | 40                              | 50                         |
| 3/8  | 3/4      | 5.90       | 16         | 5 | 30                        | 0.0100                 | 1620                      | 27                            | 40                            | 53                            | 60                            | 64                              | 80                         |
| 7/8  | 7/8      | 7.90       | 14         | 5 | 30                        | 0.0130                 | 1210                      | 27                            | 40                            | 53                            | 60                            | 64                              | 80                         |

|      |          |      |    |    |        |        |     |    |    |    |    |    |    |
|------|----------|------|----|----|--------|--------|-----|----|----|----|----|----|----|
| 1/2  | 7.90     | 13   | 5  | 30 | 0.0130 | 1210   | 27  | 40 | 53 | 60 | 64 | 80 |    |
| 9/16 | 1- 1 1/2 | 9.90 | 12 | 5  | 30     | 0.0165 | 965 | 27 | 40 | 53 | 60 | 64 | 80 |
| 5/8  |          | 9.90 | 11 | 5  | 30     | 0.0165 | 965 | 27 | 40 | 53 | 60 | 64 | 80 |

|      |          |      |    |   |    |        |      |    |    |    |    |    |    |
|------|----------|------|----|---|----|--------|------|----|----|----|----|----|----|
| 2    | 3        | 1.50 | 56 | 3 | 20 | 0.0025 | 4245 | 10 | 15 | 20 | 23 | 24 | 30 |
| 3    | 4        | 1.50 | 48 | 3 | 20 | 0.0025 | 4245 | 10 | 15 | 20 | 23 | 24 | 30 |
| 4-5  | 6        | 2.10 | 40 | 3 | 20 | 0.0035 | 3030 | 10 | 15 | 20 | 23 | 24 | 30 |
| 8    | 10       | 3.00 | 32 | 3 | 20 | 0.0050 | 2120 | 10 | 15 | 20 | 23 | 24 | 30 |
| 12   | 5/16-3/8 | 4.00 | 24 | 3 | 20 | 0.0065 | 1590 | 10 | 15 | 20 | 23 | 24 | 30 |
| 1/4  | 7/16-1/2 | 4.00 | 20 | 3 | 20 | 0.0065 | 1590 | 10 | 15 | 20 | 23 | 24 | 30 |
| 5/16 | 9/16-5/8 | 5.00 | 18 | 3 | 20 | 0.0085 | 1275 | 12 | 18 | 23 | 26 | 28 | 35 |
| 3/8  | 3/4      | 5.90 | 16 | 5 | 20 | 0.0100 | 1080 | 18 | 28 | 37 | 41 | 44 | 55 |
| 7/16 | 7/8      | 7.90 | 14 | 5 | 20 | 0.0130 | 805  | 17 | 25 | 33 | 38 | 40 | 50 |

|      |          |      |    |   |    |        |     |    |    |    |    |    |    |
|------|----------|------|----|---|----|--------|-----|----|----|----|----|----|----|
| 1/2  |          | 7.90 | 13 | 5 | 20 | 0.0130 | 805 | 17 | 25 | 33 | 38 | 40 | 50 |
| 9/16 | 1- 1 1/2 | 9.90 | 12 | 5 | 20 | 0.0165 | 645 | 18 | 28 | 37 | 41 | 44 | 55 |
| 5/8  |          | 9.90 | 11 | 5 | 20 | 0.0165 | 645 | 18 | 28 | 37 | 41 | 44 | 55 |

# Matières

## Aluminium corroyé

Si < 6%

Aluminium corroyé  
Si < 6%

| UNC  | UNF      | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>fc</sub><br>dD1<br>3/2 | v <sub>fc</sub><br>dD1<br>2/1 | v <sub>fc</sub><br>dD1<br>3/1 | v <sub>fc</sub><br>dD1<br>4/1 | v <sub>fc</sub><br>dD1<br>>5/1 | v <sub>f</sub><br>[mm/min] |
|------|----------|------------|------------|---|---------------------------|------------------------|---------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|----------------------------|
| 2    | 3        | 1.50       | 56         | 3 | 50                        | 0.0025                 | 10610                     | 27                            | 40                            | 53                            | 60                            | 64                             | 80                         |
| 3    | 4        | 1.50       | 48         | 3 | 50                        | 0.0025                 | 10610                     | 27                            | 40                            | 53                            | 60                            | 64                             | 80                         |
| 4-5  | 6        | 2.10       | 40         | 3 | 50                        | 0.0035                 | 7580                      | 27                            | 40                            | 53                            | 60                            | 64                             | 80                         |
| 8    | 10       | 3.00       | 32         | 3 | 50                        | 0.0050                 | 5305                      | 27                            | 40                            | 53                            | 60                            | 64                             | 80                         |
| 12   | 5/16-3/8 | 4.00       | 24         | 3 | 50                        | 0.0065                 | 3980                      | 27                            | 40                            | 53                            | 60                            | 64                             | 80                         |
| 1/4  | 7/16-1/2 | 4.00       | 20         | 3 | 50                        | 0.0065                 | 3980                      | 27                            | 40                            | 53                            | 60                            | 64                             | 80                         |
| 5/16 | 9/16-5/8 | 5.00       | 18         | 3 | 50                        | 0.0085                 | 3185                      | 27                            | 40                            | 53                            | 60                            | 64                             | 80                         |
| 3/8  | 3/4      | 5.90       | 16         | 5 | 50                        | 0.0100                 | 2700                      | 45                            | 68                            | 90                            | 101                           | 108                            | 135                        |
| 7/16 | 7/8      | 7.90       | 14         | 5 | 50                        | 0.0130                 | 2015                      | 43                            | 65                            | 87                            | 98                            | 104                            | 130                        |

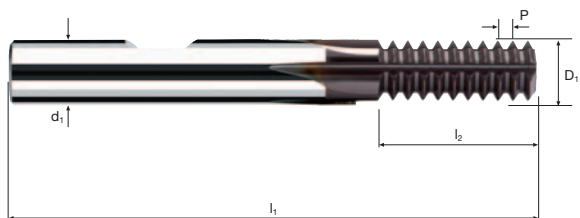
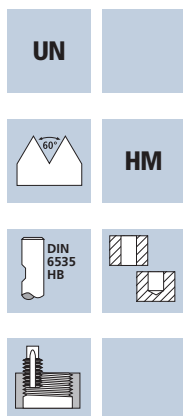
|      |          |      |    |    |        |        |      |    |    |    |     |     |     |
|------|----------|------|----|----|--------|--------|------|----|----|----|-----|-----|-----|
| 1/2  | 7.90     | 13   | 5  | 50 | 0.0130 | 2015   | 43   | 65 | 87 | 98 | 104 | 130 |     |
| 9/16 | 1- 1 1/2 | 9.90 | 12 | 5  | 50     | 0.0165 | 1610 | 45 | 68 | 90 | 101 | 108 | 135 |
| 5/8  |          | 9.90 | 11 | 5  | 50     | 0.0165 | 1610 | 45 | 68 | 90 | 101 | 108 | 135 |

|      |          |      |    |   |    |        |      |    |    |    |    |    |     |
|------|----------|------|----|---|----|--------|------|----|----|----|----|----|-----|
| 2    | 3        | 1.50 | 56 | 3 | 40 | 0.0025 | 8490 | 22 | 33 | 43 | 49 | 52 | 65  |
| 3    | 4        | 1.50 | 48 | 3 | 40 | 0.0025 | 8490 | 22 | 33 | 43 | 49 | 52 | 65  |
| 4-5  | 6        | 2.10 | 40 | 3 | 40 | 0.0035 | 6065 | 22 | 33 | 43 | 49 | 52 | 65  |
| 8    | 10       | 3.00 | 32 | 3 | 40 | 0.0050 | 4245 | 22 | 33 | 43 | 49 | 52 | 65  |
| 12   | 5/16-3/8 | 4.00 | 24 | 3 | 40 | 0.0065 | 3185 | 20 | 30 | 40 | 45 | 48 | 60  |
| 1/4  | 7/16-1/2 | 4.00 | 20 | 3 | 40 | 0.0065 | 3185 | 20 | 30 | 40 | 45 | 48 | 60  |
| 5/16 | 9/16-5/8 | 5.00 | 18 | 3 | 40 | 0.0085 | 2545 | 22 | 33 | 43 | 49 | 52 | 65  |
| 3/8  | 3/4      | 5.90 | 16 | 5 | 40 | 0.0100 | 2160 | 37 | 55 | 73 | 83 | 88 | 110 |
| 7/16 | 7/8      | 7.90 | 14 | 5 | 40 | 0.0130 | 1610 | 35 | 53 | 70 | 79 | 84 | 105 |

|      |          |      |    |    |        |        |      |    |    |    |    |     |     |
|------|----------|------|----|----|--------|--------|------|----|----|----|----|-----|-----|
| 1/2  | 7.90     | 12   | 5  | 40 | 0.0130 | 1610   | 35   | 53 | 70 | 79 | 84 | 105 |     |
| 9/16 | 1- 1 1/2 | 9.90 | 12 | 5  | 40     | 0.0165 | 1285 | 35 | 53 | 70 | 79 | 84  | 105 |
| 5/8  |          | 9.90 | 11 | 5  | 40     | 0.0165 | 1285 | 35 | 53 | 70 | 79 | 84  | 105 |



1.5xd



|                    |                       |                        |  |  |  |  |                          |                       |                           |
|--------------------|-----------------------|------------------------|--|--|--|--|--------------------------|-----------------------|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 |  |  |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Aluminium</b><br>GG(G) |
|--------------------|-----------------------|------------------------|--|--|--|--|--------------------------|-----------------------|---------------------------|

[illegible]

TM

## Application



## Matières

Aciers  
< 850 N/mm²

| NPT<br>NPTF |       | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>fc</sub><br>dD1<br>3/2 | v <sub>fc</sub><br>dD1<br>2/1 | v <sub>fc</sub><br>dD1<br>3/1 | v <sub>fc</sub><br>dD1<br>4/1 | v <sub>fc</sub><br>dD1<br>> 5/1 | v <sub>f</sub><br>[mm/min] |
|-------------|-------|------------|------------|---|---------------------------|------------------------|---------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|----------------------------|
| 1/16        | - 1/8 | 5.90       | 27         | 5 | 30                        | 0.0100                 | 1620                      | 27                            | 40                            | 53                            | 60                            | 64                              | 80                         |
| 1/4         | - 3/8 | 7.90       | 18         | 5 | 30                        | 0.0130                 | 1210                      | 27                            | 40                            | 53                            | 60                            | 64                              | 80                         |
| 1/2         | - 3/4 | 11.90      | 14         | 5 | 30                        | 0.0200                 | 800                       | 27                            | 40                            | 53                            | 60                            | 64                              | 80                         |
| 1           | - 2   | 15.90      | 12         | 6 | 30                        | 0.0265                 | 600                       | 32                            | 48                            | 63                            | 71                            | 76                              | 95                         |
|             |       |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|             |       |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|             |       |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|             |       |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |

Aciers  
850 - 1100 N/mm²

|      |       |       |    |   |    |        |      |    |    |    |    |    |    |
|------|-------|-------|----|---|----|--------|------|----|----|----|----|----|----|
| 1/16 | - 1/8 | 5.90  | 27 | 5 | 20 | 0.0100 | 1080 | 18 | 28 | 37 | 41 | 44 | 55 |
| 1/4  | - 3/8 | 7.90  | 18 | 5 | 20 | 0.0130 | 805  | 17 | 25 | 33 | 38 | 40 | 50 |
| 1/2  | - 3/4 | 11.90 | 14 | 5 | 20 | 0.0200 | 535  | 18 | 28 | 37 | 41 | 44 | 55 |
| 1    | - 2   | 15.90 | 12 | 6 | 20 | 0.0265 | 400  | 22 | 33 | 43 | 49 | 52 | 65 |
|      |       |       |    |   |    |        |      |    |    |    |    |    |    |
|      |       |       |    |   |    |        |      |    |    |    |    |    |    |
|      |       |       |    |   |    |        |      |    |    |    |    |    |    |
|      |       |       |    |   |    |        |      |    |    |    |    |    |    |

Aciers inoxydables  
[Cr-Ni/1.4301]

|      |       |       |    |   |    |        |     |    |    |    |    |    |    |
|------|-------|-------|----|---|----|--------|-----|----|----|----|----|----|----|
| 1/16 | - 1/8 | 5.90  | 27 | 5 | 15 | 0.0100 | 810 | 13 | 20 | 27 | 30 | 32 | 40 |
| 1/4  | - 3/8 | 7.90  | 18 | 5 | 15 | 0.0130 | 605 | 13 | 20 | 27 | 30 | 32 | 40 |
| 1/2  | - 3/4 | 11.90 | 14 | 5 | 15 | 0.0200 | 400 | 13 | 20 | 27 | 30 | 32 | 40 |
| 1    | - 2   | 15.90 | 12 | 6 | 15 | 0.0265 | 300 | 17 | 25 | 33 | 38 | 40 | 50 |
|      |       |       |    |   |    |        |     |    |    |    |    |    |    |
|      |       |       |    |   |    |        |     |    |    |    |    |    |    |
|      |       |       |    |   |    |        |     |    |    |    |    |    |    |
|      |       |       |    |   |    |        |     |    |    |    |    |    |    |

Fonte  
GG(G)

|      |       |       |    |   |    |        |      |    |    |    |    |     |     |
|------|-------|-------|----|---|----|--------|------|----|----|----|----|-----|-----|
| 1/16 | - 1/8 | 5.90  | 27 | 5 | 40 | 0.0100 | 2160 | 37 | 55 | 73 | 83 | 88  | 110 |
| 1/4  | - 3/8 | 7.90  | 18 | 5 | 40 | 0.0130 | 1610 | 35 | 53 | 70 | 79 | 84  | 105 |
| 1/2  | - 3/4 | 11.90 | 14 | 5 | 40 | 0.0200 | 1070 | 35 | 53 | 70 | 79 | 84  | 105 |
| 1    | - 2   | 15.90 | 12 | 6 | 40 | 0.0265 | 800  | 42 | 63 | 83 | 94 | 100 | 125 |
|      |       |       |    |   |    |        |      |    |    |    |    |     |     |
|      |       |       |    |   |    |        |      |    |    |    |    |     |     |
|      |       |       |    |   |    |        |      |    |    |    |    |     |     |
|      |       |       |    |   |    |        |      |    |    |    |    |     |     |

## Matières

Aluminium corroyé  
Si < 6%

| NPT<br>NPTF |       | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[n/min] | f <sub>z</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>fc</sub><br>d/D1<br>3/2 | v <sub>fc</sub><br>d/D1<br>2/1 | v <sub>fc</sub><br>d/D1<br>3/1 | v <sub>fc</sub><br>d/D1<br>4/1 | v <sub>fc</sub><br>d/D1<br>> 5/1 | v <sub>f</sub><br>[mm/min] |
|-------------|-------|------------|------------|---|---------------------------|------------------------|---------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|----------------------------------|----------------------------|
| 1/16        | - 1/8 | 5.90       | 27         | 5 | 50                        | 0.0100                 | 2700                      | 45                             | 68                             | 90                             | 101                            | 108                              | 135                        |
| 1/4         | - 3/8 | 7.90       | 18         | 5 | 50                        | 0.0130                 | 2015                      | 43                             | 65                             | 87                             | 98                             | 104                              | 130                        |
| 1/2         | - 3/4 | 11.90      | 14         | 5 | 50                        | 0.0200                 | 1335                      | 45                             | 68                             | 90                             | 101                            | 108                              | 135                        |
| 1           | - 2   | 15.90      | 12         | 6 | 50                        | 0.0265                 | 1000                      | 53                             | 80                             | 107                            | 120                            | 128                              | 160                        |
|             |       |            |            |   |                           |                        |                           |                                |                                |                                |                                |                                  |                            |
|             |       |            |            |   |                           |                        |                           |                                |                                |                                |                                |                                  |                            |
|             |       |            |            |   |                           |                        |                           |                                |                                |                                |                                |                                  |                            |
|             |       |            |            |   |                           |                        |                           |                                |                                |                                |                                |                                  |                            |

Fonte d'aluminium

|      |       |       |    |   |    |        |      |    |    |     |     |     |     |
|------|-------|-------|----|---|----|--------|------|----|----|-----|-----|-----|-----|
| 1/16 | - 1/8 | 5.90  | 27 | 5 | 60 | 0.0100 | 3235 | 53 | 80 | 107 | 120 | 128 | 160 |
| 1/4  | - 3/8 | 7.90  | 18 | 5 | 60 | 0.0130 | 2420 | 52 | 78 | 103 | 116 | 124 | 155 |
| 1/2  | - 3/4 | 11.90 | 14 | 5 | 60 | 0.0200 | 1605 | 53 | 80 | 107 | 120 | 128 | 160 |
| 1    | - 2   | 15.90 | 12 | 6 | 60 | 0.0265 | 1200 | 63 | 95 | 127 | 143 | 152 | 190 |
|      |       |       |    |   |    |        |      |    |    |     |     |     |     |
|      |       |       |    |   |    |        |      |    |    |     |     |     |     |
|      |       |       |    |   |    |        |      |    |    |     |     |     |     |
|      |       |       |    |   |    |        |      |    |    |     |     |     |     |

Cuivre non-allié

|      |       |       |    |   |    |        |      |    |     |     |     |     |     |
|------|-------|-------|----|---|----|--------|------|----|-----|-----|-----|-----|-----|
| 1/16 | - 1/8 | 5.90  | 27 | 5 | 70 | 0.0100 | 3775 | 63 | 95  | 127 | 143 | 152 | 190 |
| 1/4  | - 3/8 | 7.90  | 18 | 5 | 70 | 0.0130 | 2820 | 62 | 93  | 123 | 139 | 148 | 185 |
| 1/2  | - 3/4 | 11.90 | 14 | 5 | 70 | 0.0200 | 1870 | 62 | 93  | 123 | 139 | 148 | 185 |
| 1    | - 2   | 15.90 | 12 | 6 | 70 | 0.0265 | 1400 | 75 | 113 | 150 | 169 | 180 | 225 |
|      |       |       |    |   |    |        |      |    |     |     |     |     |     |
|      |       |       |    |   |    |        |      |    |     |     |     |     |     |
|      |       |       |    |   |    |        |      |    |     |     |     |     |     |
|      |       |       |    |   |    |        |      |    |     |     |     |     |     |

Thermoplastiques

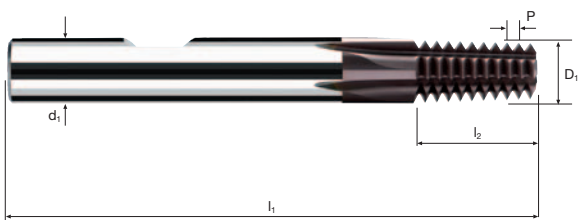
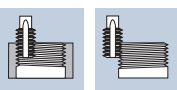
|      |       |       |    |   |    |        |      |    |     |     |     |     |     |
|------|-------|-------|----|---|----|--------|------|----|-----|-----|-----|-----|-----|
| 1/16 | - 1/8 | 5.90  | 27 | 5 | 90 | 0.0100 | 4855 | 82 | 123 | 163 | 184 | 196 | 245 |
| 1/4  | - 3/8 | 7.90  | 18 | 5 | 90 | 0.0130 | 3625 | 78 | 118 | 157 | 176 | 188 | 235 |
| 1/2  | - 3/4 | 11.90 | 14 | 5 | 90 | 0.0200 | 2405 | 80 | 120 | 160 | 180 | 192 | 240 |
| 1    | - 2   | 15.90 | 12 | 6 | 90 | 0.0265 | 1800 | 95 | 143 | 190 | 214 | 228 | 285 |
|      |       |       |    |   |    |        |      |    |     |     |     |     |     |
|      |       |       |    |   |    |        |      |    |     |     |     |     |     |
|      |       |       |    |   |    |        |      |    |     |     |     |     |     |
|      |       |       |    |   |    |        |      |    |     |     |     |     |     |

Fraises à fileter

NPT  
NPTF

60°  
1 : 16  
HM

DIN  
6535  
HB



|             |                |                 |  |  |  |  |                   |                |                    |
|-------------|----------------|-----------------|--|--|--|--|-------------------|----------------|--------------------|
| Rm<br>< 850 | Rm<br>850-1100 | Rm<br>1100-1300 |  |  |  |  | Inox<br>Stainless | Ti<br>Titanium | Aluminium<br>GG(G) |
|-------------|----------------|-----------------|--|--|--|--|-------------------|----------------|--------------------|

| Exemple:<br>N° cde |     |            |      |    |          |    |      |   | UNICUT-4X |
|--------------------|-----|------------|------|----|----------|----|------|---|-----------|
| N° d'article       |     |            |      |    |          |    |      |   | EU2200    |
| Code-ø             |     |            |      |    |          |    |      |   |           |
| Ø<br>Code          | d   | P(TPI)     | l1   | l2 | d1<br>h6 | D1 |      |   |           |
| .840               | NPT | 1/16 - 1/8 | 27   | 57 | 9.4      | 6  | 5.9  | 5 | ●         |
| .842               | NPT | 1/4 - 3/8  | 18   | 63 | 14.1     | 8  | 7.9  | 5 | ●         |
| .844               | NPT | 1/2 - 3/4  | 14   | 83 | 19.9     | 12 | 11.9 | 5 | ●         |
| .846               | NPT | 1" - 2"    | 11.5 | 92 | 26.5     | 16 | 15.9 | 6 | ●         |
|                    |     |            |      |    |          |    |      |   |           |
|                    |     |            |      |    |          |    |      |   |           |
|                    |     |            |      |    |          |    |      |   |           |
|                    |     |            |      |    |          |    |      |   |           |
|                    |     |            |      |    |          |    |      |   |           |

| Exemple:<br>N° cde |      |            |      |    |          |    |      |   | UNICUT-4X |
|--------------------|------|------------|------|----|----------|----|------|---|-----------|
| N° d'article       |      |            |      |    |          |    |      |   | EU2210    |
| Code-ø             |      |            |      |    |          |    |      |   |           |
| Ø<br>Code          | d    | P(TPI)     | l1   | l2 | d1<br>h6 | D1 |      |   |           |
| .840               | NPTF | 1/16 - 1/8 | 27   | 57 | 9.4      | 6  | 5.9  | 5 | ●         |
| .842               | NPTF | 1/4 - 3/8  | 18   | 63 | 14.1     | 8  | 7.9  | 5 | ●         |
| .844               | NPTF | 1/2 - 3/4  | 14   | 83 | 19.9     | 12 | 11.9 | 5 | ●         |
| .846               | NPTF | 1" - 2"    | 11.5 | 92 | 26.5     | 16 | 15.9 | 6 | ●         |
|                    |      |            |      |    |          |    |      |   |           |
|                    |      |            |      |    |          |    |      |   |           |
|                    |      |            |      |    |          |    |      |   |           |
|                    |      |            |      |    |          |    |      |   |           |
|                    |      |            |      |    |          |    |      |   |           |

TM

## Application



## Matières

Aciers  
850 - 1100 N/mm<sup>2</sup>

| M     | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>fc</sub><br>dD1<br>3/2 | v <sub>fc</sub><br>dD1<br>2/1 | v <sub>fc</sub><br>dD1<br>3/1 | v <sub>fc</sub><br>dD1<br>4/1 | v <sub>fc</sub><br>dD1<br>> 5/1 | v <sub>f</sub><br>[mm/min] |
|-------|------------|-----------|---|---------------------------|------------------------|---------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|----------------------------|
| ≥ M14 | 9.95       | 1.00      | 4 | 80                        | 0.0250                 | 2560                      | 85                            | 128                           | 170                           | 191                           | 204                             | 255                        |
| ≥ M14 | 9.95       | 1.25      | 4 | 80                        | 0.0250                 | 2560                      | 85                            | 128                           | 170                           | 191                           | 204                             | 255                        |
| ≥ M14 | 9.95       | 1.50      | 4 | 80                        | 0.0250                 | 2560                      | 85                            | 128                           | 170                           | 191                           | 204                             | 255                        |
| ≥ M18 | 11.95      | 1.00      | 4 | 80                        | 0.0300                 | 2130                      | 85                            | 128                           | 170                           | 191                           | 204                             | 255                        |
| ≥ M18 | 11.95      | 1.50      | 4 | 80                        | 0.0300                 | 2130                      | 85                            | 128                           | 170                           | 191                           | 204                             | 255                        |
| ≥ M24 | 15.95      | 1.00      | 5 | 80                        | 0.0400                 | 1595                      | 107                           | 160                           | 213                           | 240                           | 256                             | 320                        |
| ≥ M24 | 15.95      | 2.00      | 5 | 80                        | 0.0400                 | 1595                      | 107                           | 160                           | 213                           | 240                           | 256                             | 320                        |
| ≥ M30 | 19.95      | 1.50      | 5 | 80                        | 0.0500                 | 1275                      | 107                           | 160                           | 213                           | 240                           | 256                             | 320                        |
| ≥ M30 | 19.95      | 2.00      | 5 | 80                        | 0.0500                 | 1275                      | 107                           | 160                           | 213                           | 240                           | 256                             | 320                        |

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|       |       |      |   |    |        |      |    |    |     |     |     |     |
|-------|-------|------|---|----|--------|------|----|----|-----|-----|-----|-----|
| ≥ M14 | 9.95  | 1.00 | 4 | 50 | 0.0200 | 1600 | 43 | 65 | 87  | 98  | 104 | 130 |
| ≥ M14 | 9.95  | 1.25 | 4 | 50 | 0.0200 | 1600 | 43 | 65 | 87  | 98  | 104 | 130 |
| ≥ M14 | 9.95  | 1.50 | 4 | 50 | 0.0200 | 1600 | 43 | 65 | 87  | 98  | 104 | 130 |
| ≥ M18 | 11.95 | 1.00 | 4 | 50 | 0.0240 | 1330 | 43 | 65 | 87  | 98  | 104 | 130 |
| ≥ M18 | 11.95 | 1.50 | 4 | 50 | 0.0240 | 1330 | 43 | 65 | 87  | 98  | 104 | 130 |
| ≥ M24 | 15.95 | 1.00 | 5 | 50 | 0.0320 | 1000 | 53 | 80 | 107 | 120 | 128 | 160 |
| ≥ M24 | 15.95 | 2.00 | 5 | 50 | 0.0320 | 1000 | 53 | 80 | 107 | 120 | 128 | 160 |
| ≥ M30 | 19.95 | 1.50 | 5 | 50 | 0.0400 | 800  | 53 | 80 | 107 | 120 | 128 | 160 |
| ≥ M30 | 19.95 | 2.00 | 5 | 50 | 0.0400 | 800  | 53 | 80 | 107 | 120 | 128 | 160 |

Aciers à outil trempés  
48 - 52 HRC

|       |       |      |   |    |        |     |    |    |    |    |    |    |
|-------|-------|------|---|----|--------|-----|----|----|----|----|----|----|
| ≥ M14 | 9.95  | 1.00 | 4 | 30 | 0.0165 | 960 | 22 | 33 | 43 | 49 | 52 | 65 |
| ≥ M14 | 9.95  | 1.25 | 4 | 30 | 0.0165 | 960 | 22 | 33 | 43 | 49 | 52 | 65 |
| ≥ M14 | 9.95  | 1.50 | 4 | 30 | 0.0165 | 960 | 22 | 33 | 43 | 49 | 52 | 65 |
| ≥ M18 | 11.95 | 1.00 | 4 | 30 | 0.0200 | 800 | 22 | 33 | 43 | 49 | 52 | 65 |
| ≥ M18 | 11.95 | 1.50 | 4 | 30 | 0.0200 | 800 | 22 | 33 | 43 | 49 | 52 | 65 |
| ≥ M24 | 15.95 | 1.00 | 5 | 30 | 0.0265 | 600 | 27 | 40 | 53 | 60 | 64 | 80 |
| ≥ M24 | 15.95 | 2.00 | 5 | 30 | 0.0265 | 600 | 27 | 40 | 53 | 60 | 64 | 80 |
| ≥ M30 | 19.95 | 1.50 | 5 | 30 | 0.0335 | 480 | 27 | 40 | 53 | 60 | 64 | 80 |
| ≥ M30 | 19.95 | 2.00 | 5 | 30 | 0.0335 | 480 | 27 | 40 | 53 | 60 | 64 | 80 |

Aciers inoxydables  
[Cr-Ni/1.4301]

|       |       |      |   |    |        |      |    |    |    |     |     |     |
|-------|-------|------|---|----|--------|------|----|----|----|-----|-----|-----|
| ≥ M14 | 9.95  | 1.00 | 4 | 45 | 0.0200 | 1440 | 38 | 58 | 77 | 86  | 92  | 115 |
| ≥ M14 | 9.95  | 1.25 | 4 | 45 | 0.0200 | 1440 | 38 | 58 | 77 | 86  | 92  | 115 |
| ≥ M14 | 9.95  | 1.50 | 4 | 45 | 0.0200 | 1440 | 38 | 58 | 77 | 86  | 92  | 115 |
| ≥ M18 | 11.95 | 1.00 | 4 | 45 | 0.0240 | 1200 | 38 | 58 | 77 | 86  | 92  | 115 |
| ≥ M18 | 11.95 | 1.50 | 4 | 45 | 0.0240 | 1200 | 38 | 58 | 77 | 86  | 92  | 115 |
| ≥ M24 | 15.95 | 1.00 | 5 | 45 | 0.0320 | 900  | 48 | 73 | 97 | 109 | 116 | 145 |
| ≥ M24 | 15.95 | 2.00 | 5 | 45 | 0.0320 | 900  | 48 | 73 | 97 | 109 | 116 | 145 |
| ≥ M30 | 19.95 | 1.50 | 5 | 45 | 0.0400 | 720  | 48 | 73 | 97 | 109 | 116 | 145 |
| ≥ M30 | 19.95 | 2.00 | 5 | 45 | 0.0400 | 720  | 48 | 73 | 97 | 109 | 116 | 145 |

## Matières

Fonte  
GG(G)

| M     | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>fc</sub><br>dD1<br>3/2 | v <sub>fc</sub><br>dD1<br>2/1 | v <sub>fc</sub><br>dD1<br>3/1 | v <sub>fc</sub><br>dD1<br>4/1 | v <sub>fc</sub><br>dD1<br>> 5/1 | v <sub>f</sub><br>[mm/min] |
|-------|------------|-----------|---|---------------------------|------------------------|---------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|----------------------------|
| ≥ M14 | 9.95       | 1.00      | 4 | 120                       | 0.0250                 | 3840                      | 128                           | 193                           | 257                           | 289                           | 308                             | 385                        |
| ≥ M14 | 9.95       | 1.25      | 4 | 120                       | 0.0250                 | 3840                      | 128                           | 193                           | 257                           | 289                           | 308                             | 385                        |
| ≥ M14 | 9.95       | 1.50      | 4 | 120                       | 0.0250                 | 3840                      | 128                           | 193                           | 257                           | 289                           | 308                             | 385                        |
| ≥ M18 | 11.95      | 1.00      | 4 | 120                       | 0.0300                 | 3195                      | 128                           | 193                           | 257                           | 289                           | 308                             | 385                        |
| ≥ M18 | 11.95      | 1.50      | 4 | 120                       | 0.0300                 | 3195                      | 128                           | 193                           | 257                           | 289                           | 308                             | 385                        |
| ≥ M24 | 15.95      | 1.00      | 5 | 120                       | 0.0400                 | 2395                      | 160                           | 240                           | 320                           | 360                           | 384                             | 480                        |
| ≥ M24 | 15.95      | 2.00      | 5 | 120                       | 0.0400                 | 2395                      | 160                           | 240                           | 320                           | 360                           | 384                             | 480                        |
| ≥ M30 | 19.95      | 1.50      | 5 | 120                       | 0.0500                 | 1915                      | 160                           | 240                           | 320                           | 360                           | 384                             | 480                        |
| ≥ M30 | 19.95      | 2.00      | 5 | 120                       | 0.0500                 | 1915                      | 160                           | 240                           | 320                           | 360                           | 384                             | 480                        |

Aluminium corroyé  
Si < 6%

|       |       |      |   |     |        |      |     |     |     |     |     |     |
|-------|-------|------|---|-----|--------|------|-----|-----|-----|-----|-----|-----|
| ≥ M14 | 9.95  | 1.00 | 4 | 150 | 0.0285 | 4800 | 182 | 273 | 363 | 409 | 436 | 545 |
| ≥ M14 | 9.95  | 1.25 | 4 | 150 | 0.0285 | 4800 | 182 | 273 | 363 | 409 | 436 | 545 |
| ≥ M14 | 9.95  | 1.50 | 4 | 150 | 0.0285 | 4800 | 182 | 273 | 363 | 409 | 436 | 545 |
| ≥ M18 | 11.95 | 1.00 | 4 | 150 | 0.0340 | 3995 | 182 | 273 | 363 | 409 | 436 | 545 |
| ≥ M18 | 11.95 | 1.50 | 4 | 150 | 0.0340 | 3995 | 182 | 273 | 363 | 409 | 436 | 545 |
| ≥ M24 | 15.95 | 1.00 | 5 | 150 | 0.0455 | 2995 | 227 | 340 | 453 | 510 | 544 | 680 |
| ≥ M24 | 15.95 | 2.00 | 5 | 150 | 0.0455 | 2995 | 227 | 340 | 453 | 510 | 544 | 680 |
| ≥ M30 | 19.95 | 1.50 | 5 | 150 | 0.0570 | 2395 | 228 | 343 | 457 | 514 | 548 | 685 |
| ≥ M30 | 19.95 | 2.00 | 5 | 150 | 0.0570 | 2395 | 228 | 343 | 457 | 514 | 548 | 685 |

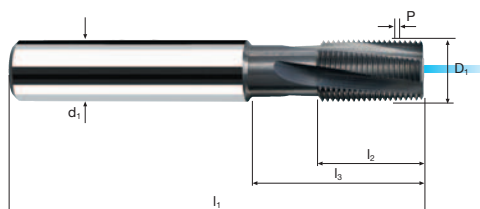
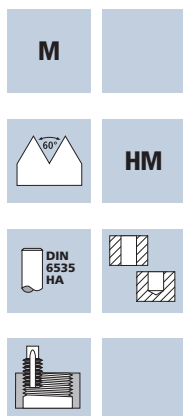
Fonte d'aluminium

|       |       |      |   |     |        |      |     |     |     |     |     |     |
|-------|-------|------|---|-----|--------|------|-----|-----|-----|-----|-----|-----|
| ≥ M14 | 9.95  | 1.00 | 4 | 200 | 0.0285 | 6400 | 243 | 365 | 487 | 548 | 584 | 730 |
| ≥ M14 | 9.95  | 1.25 | 4 | 200 | 0.0285 | 6400 | 243 | 365 | 487 | 548 | 584 | 730 |
| ≥ M14 | 9.95  | 1.50 | 4 | 200 | 0.0285 | 6400 | 243 | 365 | 487 | 548 | 584 | 730 |
| ≥ M18 | 11.95 | 1.00 | 4 | 200 | 0.0340 | 5330 | 242 | 363 | 483 | 544 | 580 | 725 |
| ≥ M18 | 11.95 | 1.50 | 4 | 200 | 0.0340 | 5330 | 242 | 363 | 483 | 544 | 580 | 725 |
| ≥ M24 | 15.95 | 1.00 | 5 | 200 | 0.0455 | 3990 | 303 | 455 | 607 | 683 | 728 | 910 |
| ≥ M24 | 15.95 | 2.00 | 5 | 200 | 0.0455 | 3990 | 303 | 455 | 607 | 683 | 728 | 910 |
| ≥ M30 | 19.95 | 1.50 | 5 | 200 | 0.0570 | 3190 | 303 | 455 | 607 | 683 | 728 | 910 |
| ≥ M30 | 19.95 | 2.00 | 5 | 200 | 0.0570 | 3190 | 303 | 455 | 607 | 683 | 728 | 910 |

Titanes alliés trempés  
> 300 HB  
[Ti6Al4V]

|       |       |      |   |    |        |      |    |    |    |    |    |     |
|-------|-------|------|---|----|--------|------|----|----|----|----|----|-----|
| ≥ M14 | 9.95  | 1.00 | 4 | 35 | 0.0200 | 1120 | 30 | 45 | 60 | 68 | 72 | 90  |
| ≥ M14 | 9.95  | 1.25 | 4 | 35 | 0.0200 | 1120 | 30 | 45 | 60 | 68 | 72 | 90  |
| ≥ M14 | 9.95  | 1.50 | 4 | 35 | 0.0200 | 1120 | 30 | 45 | 60 | 68 | 72 | 90  |
| ≥ M18 | 11.95 | 1.00 | 4 | 35 | 0.0240 | 930  | 30 | 45 | 60 | 68 | 72 | 90  |
| ≥ M18 | 11.95 | 1.50 | 4 | 35 | 0.0240 | 930  | 30 | 45 | 60 | 68 | 72 | 90  |
| ≥ M24 | 15.95 | 1.00 | 5 | 35 | 0.0320 | 700  | 37 | 55 | 73 | 83 | 88 | 110 |
| ≥ M24 | 15.95 | 2.00 | 5 | 35 | 0.0320 | 700  | 37 | 55 | 73 | 83 | 88 | 110 |
| ≥ M30 | 19.95 | 1.50 | 5 | 35 | 0.0400 | 560  | 37 | 55 | 73 | 83 | 88 | 110 |
| ≥ M30 | 19.95 | 2.00 | 5 | 35 | 0.0400 | 560  | 37 | 55 | 73 | 83 | 88 | 110 |

Incool

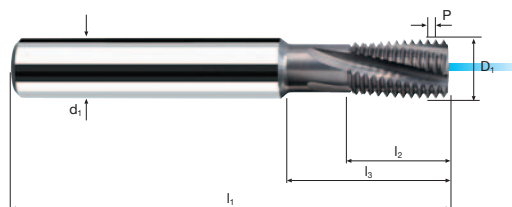
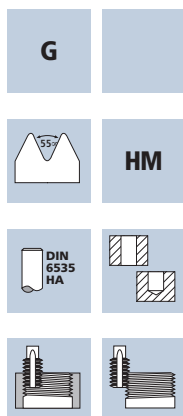


|                    |                       |                        |                        |                     |  |  |                          |                       |                           |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Aluminium</b><br>GG(G) |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|

[illegible]

| Application                                                                      | Matières                                        | G           | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>fc</sub><br>dD1<br>3/2 | v <sub>fc</sub><br>dD1<br>2/1 | v <sub>fc</sub><br>dD1<br>3/1 | v <sub>fc</sub><br>dD1<br>4/1 | v <sub>fc</sub><br>dD1<br>> 5/1 | v <sub>f</sub><br>[mm/min] |
|----------------------------------------------------------------------------------|-------------------------------------------------|-------------|------------|------------|---|---------------------------|------------------------|---------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|----------------------------|
|  | Aciers<br>850 - 1100 N/mm²                      | G1/4 - G3/8 | 9.95       | 19         | 4 | 80                        | 0.0250                 | 2560                      | 85                            | 128                           | 170                           | 191                           | 204                             | 255                        |
|                                                                                  |                                                 | G1/2 - G7/8 | 15.95      | 14         | 5 | 80                        | 0.0400                 | 1595                      | 107                           | 160                           | 213                           | 240                           | 256                             | 320                        |
|                                                                                  |                                                 | G1 - G3     | 19.95      | 11         | 5 | 80                        | 0.0500                 | 1275                      | 107                           | 160                           | 213                           | 240                           | 256                             | 320                        |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  | Aciers<br>1300 - 1500 N/mm²                     | G1/4 - G3/8 | 9.95       | 19         | 4 | 50                        | 0.0200                 | 1600                      | 43                            | 65                            | 87                            | 98                            | 104                             | 130                        |
|                                                                                  |                                                 | G1/2 - G7/8 | 15.95      | 14         | 5 | 50                        | 0.0320                 | 1000                      | 53                            | 80                            | 107                           | 120                           | 128                             | 160                        |
|                                                                                  |                                                 | G1 - G3     | 19.95      | 11         | 5 | 50                        | 0.0400                 | 800                       | 53                            | 80                            | 107                           | 120                           | 128                             | 160                        |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  | Aciers à outil trempés<br>48 - 52 HRC           | G1/4 - G3/8 | 9.95       | 19         | 4 | 30                        | 0.0165                 | 960                       | 22                            | 33                            | 43                            | 49                            | 52                              | 65                         |
|                                                                                  |                                                 | G1/2 - G7/8 | 15.95      | 14         | 5 | 30                        | 0.0265                 | 600                       | 27                            | 40                            | 53                            | 60                            | 64                              | 80                         |
|                                                                                  |                                                 | G1 - G3     | 19.95      | 11         | 5 | 30                        | 0.0335                 | 480                       | 27                            | 40                            | 53                            | 60                            | 64                              | 80                         |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  | Aciers inoxydables<br>[Cr-Ni/1.4301]            | G1/4 - G3/8 | 9.95       | 19         | 4 | 45                        | 0.0200                 | 1440                      | 38                            | 58                            | 77                            | 86                            | 92                              | 115                        |
|                                                                                  |                                                 | G1/2 - G7/8 | 15.95      | 14         | 5 | 45                        | 0.0320                 | 900                       | 48                            | 73                            | 97                            | 109                           | 116                             | 145                        |
|                                                                                  |                                                 | G1 - G3     | 19.95      | 11         | 5 | 45                        | 0.0400                 | 720                       | 48                            | 73                            | 97                            | 109                           | 116                             | 145                        |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  | Matières                                        | G           | D1<br>[mm] | P<br>(TPI) | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[min <sup>-1</sup> ] | v <sub>fc</sub><br>dD1<br>3/2 | v <sub>fc</sub><br>dD1<br>2/1 | v <sub>fc</sub><br>dD1<br>3/1 | v <sub>fc</sub><br>dD1<br>4/1 | v <sub>fc</sub><br>dD1<br>> 5/1 | v <sub>f</sub><br>[mm/min] |
|                                                                                  | Fonte<br>GG(G)                                  | G1/4 - G3/8 | 9.95       | 19         | 4 | 120                       | 0.0250                 | 3840                      | 128                           | 193                           | 257                           | 289                           | 308                             | 385                        |
|                                                                                  |                                                 | G1/2 - G7/8 | 15.95      | 14         | 5 | 120                       | 0.0400                 | 2395                      | 160                           | 240                           | 320                           | 360                           | 384                             | 480                        |
|                                                                                  |                                                 | G1 - G3     | 19.95      | 11         | 5 | 120                       | 0.0500                 | 1915                      | 160                           | 240                           | 320                           | 360                           | 384                             | 480                        |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  | Aluminium corroyé<br>Si < 6%                    | G1/4 - G3/8 | 9.95       | 19         | 4 | 150                       | 0.0285                 | 4800                      | 182                           | 273                           | 363                           | 409                           | 436                             | 545                        |
|                                                                                  |                                                 | G1/2 - G7/8 | 15.95      | 14         | 5 | 150                       | 0.0455                 | 2995                      | 227                           | 340                           | 453                           | 510                           | 544                             | 680                        |
|                                                                                  |                                                 | G1 - G3     | 19.95      | 11         | 5 | 150                       | 0.0570                 | 2395                      | 228                           | 343                           | 457                           | 514                           | 548                             | 685                        |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  | Fonte d'aluminium                               | G1/4 - G3/8 | 9.95       | 19         | 4 | 200                       | 0.0285                 | 6400                      | 243                           | 365                           | 487                           | 548                           | 584                             | 730                        |
|                                                                                  |                                                 | G1/2 - G7/8 | 15.95      | 14         | 5 | 200                       | 0.0455                 | 3990                      | 303                           | 455                           | 607                           | 683                           | 728                             | 910                        |
|                                                                                  |                                                 | G1 - G3     | 19.95      | 11         | 5 | 200                       | 0.0570                 | 3190                      | 303                           | 455                           | 607                           | 683                           | 728                             | 910                        |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  | Titanes alliés trempés<br>> 300 HB<br>[Ti6Al4V] | G1/4 - G3/8 | 9.95       | 19         | 4 | 35                        | 0.0200                 | 1120                      | 30                            | 45                            | 60                            | 68                            | 72                              | 90                         |
|                                                                                  |                                                 | G1/2 - G7/8 | 15.95      | 14         | 5 | 35                        | 0.0320                 | 700                       | 37                            | 55                            | 73                            | 83                            | 88                              | 110                        |
|                                                                                  |                                                 | G1 - G3     | 19.95      | 11         | 5 | 35                        | 0.0400                 | 560                       | 37                            | 55                            | 73                            | 83                            | 88                              | 110                        |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |
|                                                                                  |                                                 |             |            |            |   |                           |                        |                           |                               |                               |                               |                               |                                 |                            |

Incool



|                    |                       |                        |                        |                     |  |  |                          |                       |                           |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Aluminium</b><br>GG(G) |
|--------------------|-----------------------|------------------------|------------------------|---------------------|--|--|--------------------------|-----------------------|---------------------------|

[illegible]

## Application



## Matières

Aciers  
850 - 1100 N/mm<sup>2</sup>

| M   | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>fc</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|-----|------------|-----------|---|---------------------------|------------------------|--------------------------|-----------------------------|----------------------------|
| M 1 | 0.70       | 0.25      | 3 | 120                       | 0.0020                 | 54570                    | 98                          | 325                        |
| M 2 | 1.50       | 0.40      | 3 | 120                       | 0.0040                 | 25465                    | 76                          | 305                        |
| M 3 | 2.20       | 0.50      | 3 | 120                       | 0.0055                 | 17365                    | 76                          | 285                        |
| M 4 | 3.10       | 0.70      | 3 | 120                       | 0.0080                 | 12320                    | 66                          | 295                        |
| M 5 | 3.80       | 0.80      | 3 | 120                       | 0.0095                 | 10050                    | 68                          | 285                        |
| M 6 | 4.70       | 1.00      | 3 | 120                       | 0.0120                 | 8125                     | 64                          | 295                        |
| M 8 | 5.90       | 1.25      | 5 | 120                       | 0.0150                 | 6475                     | 127                         | 485                        |
| M10 | 7.90       | 1.50      | 5 | 120                       | 0.0200                 | 4835                     | 102                         | 485                        |

Aciers  
1300 - 1500 N/mm<sup>2</sup>

|     |      |      |   |     |        |       |    |     |
|-----|------|------|---|-----|--------|-------|----|-----|
| M 1 | 0.70 | 0.25 | 3 | 100 | 0.0010 | 45475 | 41 | 135 |
| M 2 | 1.50 | 0.40 | 3 | 100 | 0.0025 | 21220 | 40 | 160 |
| M 3 | 2.20 | 0.50 | 3 | 100 | 0.0035 | 14470 | 40 | 150 |
| M 4 | 3.10 | 0.70 | 3 | 100 | 0.0050 | 10270 | 35 | 155 |
| M 5 | 3.80 | 0.80 | 3 | 100 | 0.0065 | 8375  | 40 | 165 |
| M 6 | 4.70 | 1.00 | 3 | 100 | 0.0080 | 6775  | 36 | 165 |
| M 8 | 5.90 | 1.25 | 5 | 100 | 0.0100 | 5395  | 71 | 270 |
| M10 | 7.90 | 1.50 | 5 | 100 | 0.0130 | 4030  | 55 | 260 |

Aciers inoxydables  
[Cr-Ni/1.4301]

|     |      |      |   |    |        |       |    |     |
|-----|------|------|---|----|--------|-------|----|-----|
| M 1 | 0.70 | 0.25 | 3 | 80 | 0.0010 | 36380 | 33 | 110 |
| M 2 | 1.50 | 0.40 | 3 | 80 | 0.0025 | 16975 | 31 | 125 |
| M 3 | 2.20 | 0.50 | 3 | 80 | 0.0035 | 11575 | 32 | 120 |
| M 4 | 3.10 | 0.70 | 3 | 80 | 0.0050 | 8215  | 28 | 125 |
| M 5 | 3.80 | 0.80 | 3 | 80 | 0.0060 | 6700  | 29 | 120 |
| M 6 | 4.70 | 1.00 | 3 | 80 | 0.0070 | 5420  | 25 | 115 |
| M 8 | 5.90 | 1.25 | 5 | 80 | 0.0090 | 4315  | 51 | 195 |
| M10 | 7.90 | 1.50 | 5 | 80 | 0.0120 | 3225  | 41 | 195 |

Alliages à base nickel

|     |      |      |   |    |        |       |    |     |
|-----|------|------|---|----|--------|-------|----|-----|
| M 1 | 0.70 | 0.25 | 3 | 60 | 0.0010 | 27285 | 24 | 80  |
| M 2 | 1.50 | 0.40 | 3 | 60 | 0.0025 | 12735 | 24 | 95  |
| M 3 | 2.20 | 0.50 | 3 | 60 | 0.0035 | 8680  | 24 | 90  |
| M 4 | 3.10 | 0.70 | 3 | 60 | 0.0050 | 6160  | 20 | 90  |
| M 5 | 3.80 | 0.80 | 3 | 60 | 0.0060 | 5025  | 22 | 90  |
| M 6 | 4.70 | 1.00 | 3 | 60 | 0.0070 | 4065  | 18 | 85  |
| M 8 | 5.90 | 1.25 | 5 | 60 | 0.0090 | 3235  | 38 | 145 |
| M10 | 7.90 | 1.50 | 5 | 60 | 0.0120 | 2420  | 30 | 145 |

## Matières

Aluminium corroyé  
Si < 6%

| M   | D1<br>[mm] | P<br>[mm] | z | v <sub>c</sub><br>[m/min] | f <sub>z</sub><br>[mm] | n<br>[mm <sup>-1</sup> ] | v <sub>fc</sub><br>[mm/min] | v <sub>f</sub><br>[mm/min] |
|-----|------------|-----------|---|---------------------------|------------------------|--------------------------|-----------------------------|----------------------------|
| M 1 | 0.70       | 0.25      | 3 | 150                       | 0.0015                 | 60000                    | 81                          | 270                        |
| M 2 | 1.50       | 0.40      | 3 | 150                       | 0.0035                 | 31830                    | 84                          | 335                        |
| M 3 | 2.20       | 0.50      | 3 | 150                       | 0.0050                 | 21705                    | 87                          | 325                        |
| M 4 | 3.10       | 0.70      | 3 | 150                       | 0.0070                 | 15405                    | 73                          | 325                        |
| M 5 | 3.80       | 0.80      | 3 | 150                       | 0.0085                 | 12565                    | 77                          | 320                        |
| M 6 | 4.70       | 1.00      | 3 | 150                       | 0.0105                 | 10160                    | 69                          | 320                        |
| M 8 | 5.90       | 1.25      | 5 | 150                       | 0.0130                 | 8095                     | 138                         | 525                        |
| M10 | 7.90       | 1.50      | 5 | 150                       | 0.0175                 | 6045                     | 111                         | 530                        |

Fonte d'aluminium

|     |      |      |   |     |        |       |     |     |
|-----|------|------|---|-----|--------|-------|-----|-----|
| M 1 | 0.70 | 0.25 | 3 | 180 | 0.0020 | 60000 | 108 | 360 |
| M 2 | 1.50 | 0.40 | 3 | 180 | 0.0040 | 38200 | 115 | 460 |
| M 3 | 2.20 | 0.50 | 3 | 180 | 0.0055 | 26045 | 115 | 430 |
| M 4 | 3.10 | 0.70 | 3 | 180 | 0.0080 | 18485 | 100 | 445 |
| M 5 | 3.80 | 0.80 | 3 | 180 | 0.0095 | 15080 | 103 | 430 |
| M 6 | 4.70 | 1.00 | 3 | 180 | 0.0120 | 12190 | 95  | 440 |
| M 8 | 5.90 | 1.25 | 5 | 180 | 0.0150 | 9710  | 192 | 730 |
| M10 | 7.90 | 1.50 | 5 | 180 | 0.0200 | 7255  | 152 | 725 |

Cuivre non-allié

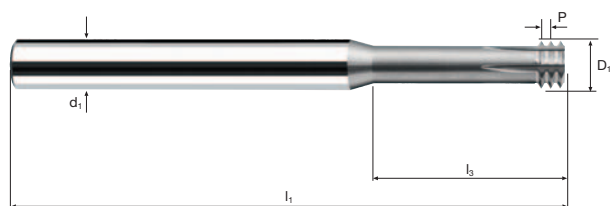
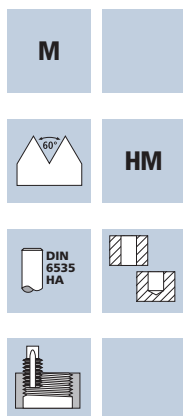
|     |      |      |   |     |        |       |    |     |
|-----|------|------|---|-----|--------|-------|----|-----|
| M 1 | 0.70 | 0.25 | 3 | 100 | 0.0015 | 45475 | 62 | 205 |
| M 2 | 1.50 | 0.40 | 3 | 100 | 0.0030 | 21220 | 48 | 190 |
| M 3 | 2.20 | 0.50 | 3 | 100 | 0.0045 | 14470 | 52 | 195 |
| M 4 | 3.10 | 0.70 | 3 | 100 | 0.0060 | 10270 | 42 | 185 |
| M 5 | 3.80 | 0.80 | 3 | 100 | 0.0075 | 8375  | 46 | 190 |
| M 6 | 4.70 | 1.00 | 3 | 100 | 0.0095 | 6775  | 42 | 195 |
| M 8 | 5.90 | 1.25 | 5 | 100 | 0.0120 | 5395  | 85 | 325 |
| M10 | 7.90 | 1.50 | 5 | 100 | 0.0160 | 4030  | 67 | 320 |

Titanes alliés trempés  
> 300 HB  
[Ti6Al4V]

|     |      |      |   |    |        |       |    |     |
|-----|------|------|---|----|--------|-------|----|-----|
| M 1 | 0.70 | 0.25 | 3 | 70 | 0.0010 | 31830 | 29 | 95  |
| M 2 | 1.50 | 0.40 | 3 | 70 | 0.0025 | 14855 | 28 | 110 |
| M 3 | 2.20 | 0.50 | 3 | 70 | 0.0035 | 10130 | 28 | 105 |
| M 4 | 3.10 | 0.70 | 3 | 70 | 0.0050 | 7190  | 25 | 110 |
| M 5 | 3.80 | 0.80 | 3 | 70 | 0.0060 | 5865  | 25 | 105 |
| M 6 | 4.70 | 1.00 | 3 | 70 | 0.0070 | 4740  | 22 | 100 |
| M 8 | 5.90 | 1.25 | 5 | 70 | 0.0090 | 3775  | 45 | 170 |
| M10 | 7.90 | 1.50 | 5 | 70 | 0.0120 | 2820  | 36 | 170 |



## 3.0xd



|                    |                       |                        |                        |  |  |  |                          |                       |                                                          |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|-----------------------|----------------------------------------------------------|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 |  |  |  | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium | <b>Aluminium</b><br><b>GG(G)</b><br><b>Nickel-Alloys</b> |
|--------------------|-----------------------|------------------------|------------------------|--|--|--|--------------------------|-----------------------|----------------------------------------------------------|

[illegible]



Informations sur les outils de perçage

424 – 429

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Informations sur les outils de filetage

430 – 449

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Informations générales

450 – 460

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# Légende concernant la page des produits sur les outils de perçage

## Technologies d'outil



Forets de perçage avec quatre chanfreins (Deux frictions et deux terrains guide)

- Amélioration de la rectitude de l'alésage
- Meilleure qualité de perçage et meilleur alignement
- Cours de l'alésage limité lors du perçage de trous transversaux
- Alignement précis des trous avec de bonnes surfaces et soutien optimal de l'outil à la sortie



Forets de perçage avec rainure de dégagement polie et optimisée et avec arrosage central

- Réduction de la friction ce qui réduit la tendance à l'adhésion ainsi que la formation de chaleur et améliore le dégagement des copeaux



Forets de perçage avec rainure de dégagement polie et optimisée, sans arrosage central

- Réduction de la friction ce qui réduit la tendance à l'adhésion ainsi que la formation de chaleur et améliore le dégagement des copeaux



Forets de perçage avec attachement de qualité h5

- Précision élevée de la concentricité et de l'excentricité
- Optimal pour les systèmes de fixation de précision

## Matières de coupe

**HM  
XA**

Carbure micrograin dureté 1950 HV. Teneur en cobalt 8%. Se distingue particulièrement par sa résistance à l'abrasion.

**HM  
MGX**

Carbure micrograin de haute performance avec carbures de tungstène ultrafins. Dureté 1610 HV. Teneur en cobalt 10%.

**HM  
MG10**

Carbure micrograin dureté 1600 HV. Teneur en cobalt 10%.

**HM  
MGD<sup>2</sup>**

Carbure micrograin à haute résistance à la flexion et au cisaillement présentant une excellente élasticité.

**HM**

Carbure universelle à micro grains.

**HSS**

Matière de coupe de haute performance, alliage ASR produit par fusion métallurgique.

# Légende concernant la page des produits sur les outils de perçage

## Arrosage intégré



Les forets avec arrosage central garantissent une meilleure formation et dégagement de copeaux en garantissant l'augmentation du processus de sécurité et une augmentation de durée de vie de l'outil.



Foret sans arrosage central.

## Angle de pointe et angle d'hélice



L'ampleur de l'angle de pointe influence de manière décisive le spectre des matériaux usinables. De plus, les petits angles de pointe garantissent un meilleur centrage; les grands angles de pointe diminuent le couple de rotation.



En ce qui concerne les forets de perçage, l'angle d'hélice influence de manière décisive l'angle de coupe sur l'arête principale (pointe du foret). De ce fait, les angles d'hélice élevés sont à utiliser pour les matières tendres, les petits angles d'hélices pour les matières dures et fragiles.

## Exécutions et dimensions de forets hélicoïdaux

Forets hélicoïdaux en carbure, 3xd

Les dimensions de cet outil correspondent aux indications selon DIN 6537 K «Forets hélicoïdaux en carbure avec queue cylindrique dégagée».

Forets hélicoïdaux en carbure, 5xd

Les dimensions de cet outil correspondent aux indications selon DIN 6537 L «Forets hélicoïdaux en carbure avec queue cylindrique dégagée».

Forets hélicoïdaux en carbure et forets pour perçage profonds en carbure, supérieur à 5xd

Conformément à la norme de l'entreprise.

Forets hélicoïdaux en carbure 8xd, optimisés

Conformément à la norme de l'entreprise, mais avec un rapport l/d optimisé pour la stabilité optimal de l'outil.

## Exécutions et dimensions spéciales

90°

Indication de l'angle de pointe pour les forets à pointer ou les alésoirs.  
Alésoirs 90° selon DIN 335

## Profondeurs du perçage

Indication de la profondeur de perçage nominale. (Exemple: 5xd: 5 fois le diamètre de perçage).

La profondeur de perçage nominale ne correspond pas à la profondeur maximale! La profondeur de perçage maximale est indiquée sous  $L_{max}$ .

# Légende concernant la page des produits sur les outils de perçage

## Forme de la queue / Exécutions de queues

-  Outils VHM avec queue cylindrique: exécution de queue selon DIN 6535 HA
-  Outils VHM avec queue cylindrique et méplat: exécution de queue selon DIN 6535 HB
-  Microforets en carbure monobloc et forets pour perçages profonds à tige cylindrique: exécution de la tige selon la norme d'usine

## Aptitude aux opérations d'usinage

-  Un fond bleu signifie que l'outil est remarquablement bien adapté à ce matériau.
-  Un fond bleu clair signifie que l'outil est bien ou suffisamment adapté à ce matériau.

|                    |                       |                        |                        |                     |                     |                    |                          |                       |  |
|--------------------|-----------------------|------------------------|------------------------|---------------------|---------------------|--------------------|--------------------------|-----------------------|--|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 | <b>Rm</b><br>1300-1500 | <b>HRC</b><br>48-56 | <b>HRC</b><br>56-60 | <b>HRC</b><br>> 60 | <b>Inox</b><br>Stainless | <b>Ti</b><br>Titanium |  |
|--------------------|-----------------------|------------------------|------------------------|---------------------|---------------------|--------------------|--------------------------|-----------------------|--|

Le champ supplémentaire indique les autres matériaux pouvant être usinés.

## Abréviations

- d<sub>1</sub>** Diamètre de coupe [mm]
- d<sub>2</sub>** Diamètre de queue [mm]
- d<sub>3</sub>** La zone face de diamètre des fraises coniques [mm]
- l<sub>1</sub>** Longueur totale de l'outil [mm]
- l<sub>2</sub>** Longueur de la rainure à copeaux [mm]
- l<sub>3</sub>** Longueur du 2ème étage (Forets à étages) [mm]
- l<sub>4</sub>** Longueur de la queue [mm]
- L<sub>max</sub>** Profondeur maximale de perçage de l'outil
- L<sub>k</sub>** Profondeur de perçage pour chanfrein (Forets à étages)

# Instructions techniques pour l'utilisation des outils de perçage

## La pression de lubrification et de refroidissement

Fondamentalement, le perçage est réalisé avec lubrification. L'objectif est d'optimiser l'efficacité du rapport copeaux/ évacuation de chaleur. Les aciers trempés ou les matériaux abrasifs peuvent également être travaillés à sec ou avec une quantité minimale de lubrification.

Si le liquide de refroidissement est ajouté par l'extérieur, il faut assurer le bon positionnement de celui-ci. Il devra être dirigé dans le goujure (parallèle à l'angle d'hélice) et dans le trou d'entrée.

L'utilisation de l'arrosage central assure une amélioration de la durée de vie et des performances de l'outil. Il est nécessaire d'adapter la pression minimale de lubrification par rapport au diamètre de l'outil.

Le tableau suivant fournit une ligne directrice de la pression du liquide de refroidissement recommandée par Fraisa pour l'arrosage central des forets hélicoïdaux:

| Pression nécessaire du liquide de refroidissement pour les forets hélicoïdaux avec arrosage central avec volume optimisé |          |          |          |           |            |            |
|--------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|-----------|------------|------------|
| Exécutions                                                                                                               | < ø 3 mm | ø 3-5 mm | ø 5-8 mm | ø 8-12 mm | ø 12-16 mm | ø 16-20 mm |
| jusqu'à 5xd                                                                                                              | 60 bar   | 50 bar   | 30 bar   | 25 bar    | 20 bar     | 15 bar     |
| 8xd – 30xd                                                                                                               | 80 bar   | 60 bar   | 40 bar   | 30 bar    | 25 bar     | 20 bar     |
| Pression nécessaire du liquide de refroidissement pour les forets hélicoïdaux avec arrosage central/MMS                  |          |          |          |           |            |            |
| Exécutions                                                                                                               | < ø 3 mm | ø 3-5 mm | ø 5-8 mm | ø 8-12 mm | ø 12-16 mm | ø 16-20 mm |
| jusqu'à 5xd                                                                                                              | 12 bar   | 10 bar   | 9 bar    | 8 bar     | 8 bar      | 7 bar      |
| 8xd – 30xd                                                                                                               | 14 bar   | 12 bar   | 10 bar   | 9 bar     | 9 bar      | 8 bar      |

## Concentricité

La précision de concentricité dans le processus de perçage est entre autre un paramètre important du process. L'erreur de concentricité doit être aussi petite que possible, car cela influence fortement l'usure. Le faux-rond doit être contrôlé en particulier dans les diamètres de perçage inférieurs à 6 mm. La mesure de contrôle est réalisée avec un outil monté dans son moyen de serrage et sur la broche de la machine.

Le tableau suivant fournit une ligne directrice du défaut de concentricité max. recommandée de Fraisa:

| Erreur max. de concentricité de forets hélicoïdaux |          |          |          |           |            |            |
|----------------------------------------------------|----------|----------|----------|-----------|------------|------------|
| Plage de diamètres                                 | < ø 1 mm | ø 1-3 mm | ø 3-6 mm | ø 6-10 mm | ø 10-16 mm | ø 16-20 mm |
| Erreur max. de concentricité                       | 3 µm     | 5 µm     | 10 µm    | 15 µm     | 20 µm      | 25 µm      |

## Centrage et alésage pilote

Forets de perçage doit toujours être perpendiculaire à la pièce. Si le perçage inclinée est obligatoire, il est indispensable de réaliser une surface perpendiculaire à l'outil.

L'angle de pointe du foret à centrer doit toujours être supérieur à l'angle de pointe du foret hélicoïdal. Ainsi, un centrage optimal et une meilleure tenue à l'usure sont obtenus.

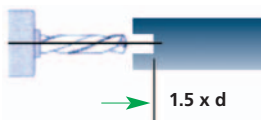
Fraisa donne la recommandation suivante pour les centrages et les alésages pilotes:

| Exécutions  | Matières de coupe | Recommandation                                                               |
|-------------|-------------------|------------------------------------------------------------------------------|
| jusqu'à 5xd | Carbure           | Non                                                                          |
| jusqu'à 5xd | ASR               | Oui                                                                          |
| 8xd         | Carbure           | Facultatif. Une amélioration de cylindricité peut être obtenue par centrage. |
| 12xd – 30xd | Carbure           | Oui, un trou pilote est nécessaire (voir page 428)                           |

# Instructions techniques pour l'utilisation des forets pour perçage profonds

Pour améliorer tant la durabilité que la fiabilité des forets, Fraisa SA recommande de procéder comme suit lors du perçage:

## 1<sup>ère</sup> Etape

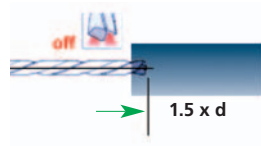


Alésage pilote =  $1.5 \times d$ .

p. ex. Supradrill® U 3xd. B62011.

**L'alésage pilote doit être exempt de copeaux avant la pénétration du foret!**

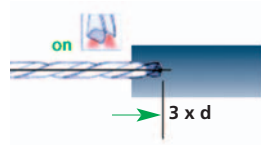
## 2<sup>ème</sup> Etape



Introduire l'outil dans l'alésage à une vitesse de 300 t/min et une vitesse d'avance  $v_f$  de 1000mm/min.

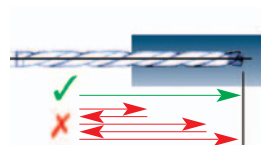
Sans liquide de refroidissement jusqu'à 1 mm du fond de l'alésage pilote.

## 3<sup>ème</sup> Etape



Percer afin d'obtenir 3xd à une vitesse de coupe et d'avance réduite. Réduire ainsi la vitesse de coupe et d'avance à 40 % des données de coupe recommandées par Fraisa. L'alimentation en liquide de refroidissement doit être mise en marche.

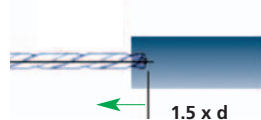
## 4<sup>ème</sup> Etape



Augmenter la vitesse de rotation et d'avance de façon à obtenir les données de coupe recommandées; sans interruption de l'avance, le foret devant être en prise.

**Poursuivre l'alésage sans ventilation!**

## 5<sup>ème</sup> Etape

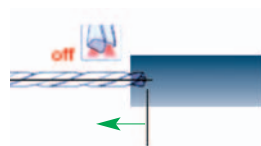


Reculer le foret avec

$v_f = 1000 \text{ mm/min}$ , jusqu'à  $1.5 \times d$  de l'entrée d'alésage.

Position comme 2<sup>ème</sup> étape.

## 6<sup>ème</sup> Etape



Ensuite, réduire la vitesse à maximum 300 t/min.

Arrêter l'arrosage.

Retirer le foret de l'alésage.

### CONSEIL DE SECURITE

Les forets longs pour perçages profonds ne doivent tourner qu'à une vitesse faible (max. 300 t/min) lorsque ceux-ci sont à l'extérieur de l'alésage.

Toute vitesse de rotation plus élevée risque de causer des vibrations au niveau du foret et, par là, une rupture de l'outil.



# Formules concernant les données de coupe

|                      |                                                                                       |
|----------------------|---------------------------------------------------------------------------------------|
| <b>d<sub>1</sub></b> | Diamètre de coupe [mm]                                                                |
| <b>v<sub>c</sub></b> | Vitesse de coupe [m/min]                                                              |
| <b>f</b>             | Avance par tour [mm]                                                                  |
| <b>n</b>             | Nombre de tours [min <sup>-1</sup> ]                                                  |
| <b>v<sub>f</sub></b> | Vitesse d'avance [mm/min]                                                             |
| <b>Q</b>             | Débit de copeaux en volume [cm <sup>3</sup> /min]                                     |
| <b>T</b>             | Temps principal de traitement pour la profondeur de perçage maximale de l'outil [sec] |
| <b>L</b>             | Profondeur de perçage effective [mm]                                                  |

|                 |                                                                                |
|-----------------|--------------------------------------------------------------------------------|
| Nombre de tours | $n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \left[ \frac{1}{\text{min}} \right]$ |
|-----------------|--------------------------------------------------------------------------------|

|                  |                                                                                       |
|------------------|---------------------------------------------------------------------------------------|
| Vitesse de coupe | $v_c = \frac{d_1 \cdot n \cdot \pi}{1000} \left[ \frac{\text{m}}{\text{min}} \right]$ |
|------------------|---------------------------------------------------------------------------------------|

|                  |                                                               |
|------------------|---------------------------------------------------------------|
| Vitesse d'avance | $v_f = f \cdot n \left[ \frac{\text{mm}}{\text{min}} \right]$ |
|------------------|---------------------------------------------------------------|

|                            |                                                                                                    |
|----------------------------|----------------------------------------------------------------------------------------------------|
| Débit de copeaux en volume | $Q = \frac{d_1^2 \cdot \pi \cdot v_f}{4 \cdot 1000} \left[ \frac{\text{cm}^3}{\text{min}} \right]$ |
|----------------------------|----------------------------------------------------------------------------------------------------|

|                               |                                                        |
|-------------------------------|--------------------------------------------------------|
| Temps principal de traitement | $T = \frac{L}{v_f} \cdot 60 \left[ \text{sec} \right]$ |
|-------------------------------|--------------------------------------------------------|

# Codes matières sur les outils de filetage

## Tarauds



08

Aciers < 850 N/mm<sup>2</sup>

11

Aciers 850 - 1100 N/mm<sup>2</sup>

15

Aciers 1100 - 1500 N/mm<sup>2</sup>

60

Aciers trempés 48 - 60 HRC

In

Aciers inoxydables

GG

Fonte grise/sphéroïdale

Al

Aluminium

Ti

Titanes alliés trempés

Ni

Alliages à base nickel trempés

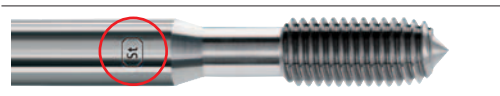
R

Universal Rigid

U

Universal

## Tarauds à refouler



St

Aciers

Al

Aluminium

U

Universal

# Légende concernant la page des produits sur les outils de filetage

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## Types de filetage

|             |                                                           |
|-------------|-----------------------------------------------------------|
| <b>M</b>    | Filetage métrique ISO, selon DIN ISO 965 (DIN 13)         |
| <b>MF</b>   | Filetage métrique pas fin ISO, selon DIN ISO 965 (DIN 13) |
| <b>MJ</b>   | Filetage MJ pour l'aéronautique selon DIN ISO 5855        |
| <b>G</b>    | Filetage Whitworth pas de gaz selon DIN ISO 228           |
| <b>UNC</b>  | Filetage américain selon ASME B1.1                        |
| <b>UNJC</b> | Filetage américain selon SAE AS 8879                      |
| <b>UNF</b>  | Filetage américain pas fin selon ASME B1.1                |
| <b>UNJF</b> | Filetage américain pas fin selon SAE AS 8879              |
| <b>NPT</b>  | Filetage américain pas de gaz conique selon ANSI B1.20.1  |
| <b>NPTF</b> | Filetage américain pas de gaz conique selon ANSI B1.20.3  |
| <b>EG M</b> | Filetage métrique pour filets rapportés selon DIN 8140-2  |

# Légende concernant la page des produits sur les outils de filetage

## Classe d'applications / Positions de la tolérance

|                             |                                                                                                                                                                                                                                                                                    |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ISO 2</b><br>(6H)        | Les outils de taraudage de la classe d'application 2 (ISO 2) sont conçus pour la fabrication de filetages, zones de tolérance 4G, 5G, 6H.                                                                                                                                          |
| <b>ISO 1</b><br>(4H)        | Les outils de taraudage de la classe d'application 1 (ISO 1) sont conçus pour la fabrication de filetages, zones de tolérance 4H, 5H.                                                                                                                                              |
| <b>ISO 3</b><br>(6G)        | Les outils de taraudage de la classe d'application 3 (ISO 3) sont conçus pour la fabrication de filetages, zones de tolérance 6G, 7H, 8H.                                                                                                                                          |
| <b>7G</b>                   | Les outils de taraudage de la classe d'application 7G sont conçus pour la fabrication de filetages en surcote, zones de tolérance 7G, 8G, avant traitement thermique.                                                                                                              |
| <b>ISO 2</b><br><b>+0,1</b> | Les outils de taraudage de la classe d'application 2 (ISO 2) sont conçus pour la fabrication de filetages, zones de tolérance 4G, 5G, 6H. En prévention d'un traitement de surface thermique d'une épaisseur de 0.025 mm, les outils sont conçus avec tolérance de plus de 0.1 mm. |
| <b>4H</b>                   | Les outils de taraudage de la classe d'application 4H sont conçus pour la fabrication de filetages MJ, zones de tolérance 4H (ASME B1.1).                                                                                                                                          |
| <b>2B</b>                   | Les outils de taraudage de l'application 2B sont conçus pour la fabrication de filetages, zones de tolérance 2B.                                                                                                                                                                   |
| <b>3B</b>                   | Les outils de taraudage de l'application 3B sont conçus pour la fabrication de filetages, zones de tolérance 3B.                                                                                                                                                                   |
| <b>6H</b><br><b>mod</b>     | Les outils de taraudage de l'application 6H sont conçus pour la fabrication de filetages pour filets rapportés.                                                                                                                                                                    |

## Matières de coupe

|                            |                                                                                                                     |
|----------------------------|---------------------------------------------------------------------------------------------------------------------|
| <b>HSS</b><br><b>PM/F</b>  | Matière de coupe de haute performance, alliage ASR produit en métallurgie des poudres.                              |
| <b>HSS-E</b><br><b>Co5</b> | Matière de coupe de haute performance, alliage ASR produit par fusion métallurgique avec un cote-part en Co de 5 %. |
| <b>HM</b><br><b>MG10</b>   | Carbure universelle à micro grains. Dureté 1600 HV avec un cote-part en Co de 10%.                                  |
| <b>HM</b>                  | Carbure universelle à micro grains.                                                                                 |

# Légende concernant la page des produits sur les outils de filetage

## Norme du filetage



Le profile du taraud correspond aux normes mentionnées sous «Types de filetage».

## Formes de queue



Queue de serrage cylindrique selon normes d'outils indiquées.



Queue de serrage cylindrique avec méplat selon normes d'outils indiquées.



Queue de serrage cylindrique avec carré selon normes d'outils indiquées.



Queue de serrage cylindrique avec carré similaires aux normes d'outils indiquées.



Queue de serrage cylindrique avec carré.

## Formes des trous de perçage

Les avant-trous de perçage doivent correspondre au filetage prévu.  
(Règle général pour le taraudage: diamètre de perçage = diamètre nominal du taraudage – le pas).



Outil à fileter conçu pour des trous borgnes.



Outil à fileter conçu pour des trous traversants.



Outil à fileter conçu pour des trous borgnes et traversants.



Outil à fileter conçu pour les trous borgnes coniques et traversants coniques.

# Légende concernant la page des produits sur les outils de filetage

## Formes d'attaque / Formes de guidage du cône



Forme d'attaque pour tarauds selon DIN 2197, table 4: type B. Le nombre de pas est entre 3.5 et 5.



Forme d'attaque pour tarauds selon DIN 2197, table 4: type C. Le nombre de pas est entre 2 et 3.  
L'angle d'entrée de guidage du cône pour le taraud à refouler selon DIN 2175, table 4: type C, soit:  $2 \text{ à } 3 \times \text{le pas}$ .



L'angle d'entrée de guidage du cône pour le taraud à refouler selon DIN 2175, table 4: type E, soit:  $2 \times \text{le pas au maximum}$ .

## Evacuation de copeaux



Outil à fileter avec évacuation de copeaux vers l'avant.



Outil à fileter avec évacuation de copeaux vers l'arrière.



Outil à fileter pour matière à copeaux cassant.

## Tarauds à refouler



Outil à fileter forme polygonale sans rainures de lubrification.



Outil à fileter forme polygonale avec rainures de lubrification.

## Fraises à fileter



Approprié pour filetage intérieur.



Approprié pour filetage extérieur.

# Légende concernant la page des produits sur les outils de filetage

## Aptitude aux opérations d'usinage



Un fond bleu signifie que l'outil est remarquablement bien adapté à ce matériau.



Un fond bleu clair signifie que l'outil est bien ou suffisamment adapté à ce matériau.



Le champ supplémentaire indique les autres matériaux pouvant être usinés.

## Lubrifiants réfrigérants

En général, lors la fabrication des taraudages par perçage et surtout par refoulage du filet une lubrifications suffisante doit être garantie. Plus le taraudage est profond, plus une lubrification est importante.

Lors de la fabrication des taraudages, les meilleurs résultats peuvent être obtenus avec huile (effet de lubrification). L'usinage avec une émulsion de 5% au minimum est également possible.



Pour l'usinage, l'huile comme lubrifiant est nécessaire.

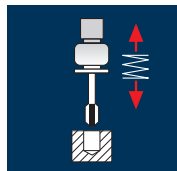


Pour l'usinage, une huile avec additifs spéciaux comme lubrifiant est nécessaire.



Définir le diamètre du trou de perçage selon colonne matériaux critiques à la page 445.

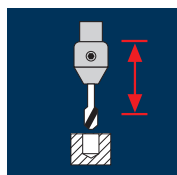
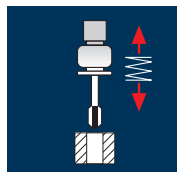
# Instructions techniques pour l'utilisation des outils de filetage



## Taraudage avec mandrin de compensation de longueur

La fonction de compensation du mandrin doit être garantie (pas de grippage). Si non, les conséquences peuvent être un filetage défectueux ou un pas incorrect. La force de traction du mandrin à compensation de longueur doit être choisie en fonction du filetage et de la matière à usiner.

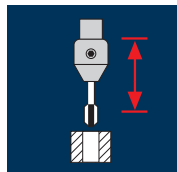
La programmation d'une vitesse de rotation trop élevée peut générer des problèmes. Si la vitesse de rotation sélectionnée ne peut pas être atteinte (en raison de l'inertie de la machine), cela peut entraîner la rupture précoce de l'outil ou des défauts d'usinage du filet. En y regardant plus précisément, une haute vitesse de rotation n'engendre souvent pas l'économie de temps espérée.



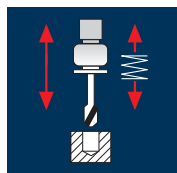
## Rigid Tapping

Rigid Tapping est utilisé pour des machines modernes avec commande des broches synchronisée. Tous les outils ont un méplat et peuvent être employés dans des mandrins conventionnels.

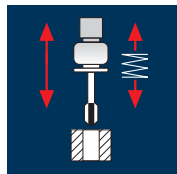
Lors du taraudage en Rigid Tapping, une distance de sécurité programmée doit être suffisamment grande. Si ce n'est pas le cas, avant l'entrée dans le trou se pose le problème de la désynchronisation de la broche de la machine et de l'avance. La conséquence est alors une erreur de pas, y compris lors du taraudage en mode synchronisé.



Chez diverses machines, c'est possible que le nombre de tours recommandé ne peut pas être atteint dans l'usinage synchrone. Dans ces cas, il est nécessaire de travailler avec le maximum de nombre de tours où le synchronisme de la machine est encore garanti.



## Taraudage avec mandrin de compensation de longueur ou Rigid Tapping





# Instructions techniques pour l'utilisation des outils de filetage



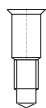
## Durcissement des parois du trou

Lors du perçage, il convient de veiller à utiliser une mèche adaptée et intacte. Si l'usure est trop importante, le perçage peut entraîner le durcissement de la zone de contact. Une conséquence de ce durcissement peut provoquer la rupture du taraud.



## Durcissement et refoulement du chanfrein

Pour préparer le trou, il convient d'utiliser de bons outils, adaptés au matériau. L'utilisation d'un foret aléueur trop usé entraîne le durcissement ou le refoulement du chanfrein. L'outil a alors des problèmes déjà à son entrée ce qui peut provoquer des ébréchantures. Le chanfreinage du trou est important pour le guidage du taraud.



## Filetages profonds

La fabrication de filetages profonds nécessite l'usage d'outils à longues goujures. Dans le cas contraire, le problème de la rupture de l'outil en raison d'une accumulation de copeaux peut se présenter, car les copeaux ne peuvent pas s'évacuer hors du trou. En Rigid Tapping, il est possible d'usiner le filetage en plusieurs étapes, afin de raccourcir les copeaux. Il est important que le refroidissement soit suffisant.



## Fonction du mandrin à compensation de longueur

La fonction de compensation de longueur du mandrin doit être garantie (pas de grippage). Si non les conséquences peuvent être un filetage défectueux ou un pas de filetage incorrect. La force de traction du mandrin à compensation de longueur doit être choisie en fonction du filetage à usiner.



## Orientation correcte du jet de liquide de refroidissement

L'orientation du jet de liquide de refroidissement joue un rôle important lors du taraudage par enlèvement de copeaux. Il faut que le jet soit dirigé depuis en haut en direction des goujures de sorte à ce que le refroidissement soit aussi efficace en profondeur. Un jet mal dirigé peut causer des problèmes de génération de température dans le trou et, de ce fait, de soudage à froid du matériau ce qui peut avoir pour conséquence la mauvaise formation des copeaux et la réduction de la durée de vie de l'outil.



## Distance de sécurité

Lors du taraudage en Rigid Tapping, une distance de sécurité programmée doit être suffisamment grande. Si ce n'est pas le cas, avant l'entrée dans le trou se pose le problème de la désynchronisation de la broche de la machine et de l'avance. La conséquence est alors une erreur de pas, y compris lors du taraudage en mode synchronisé.



## Aptitude de la machine

Il est possible que diverses machines ne puissent pas fonctionner à la vitesse de rotation recommandée. Dans un tel cas, la vitesse de rotation de la machine doit être programmée en conséquence.

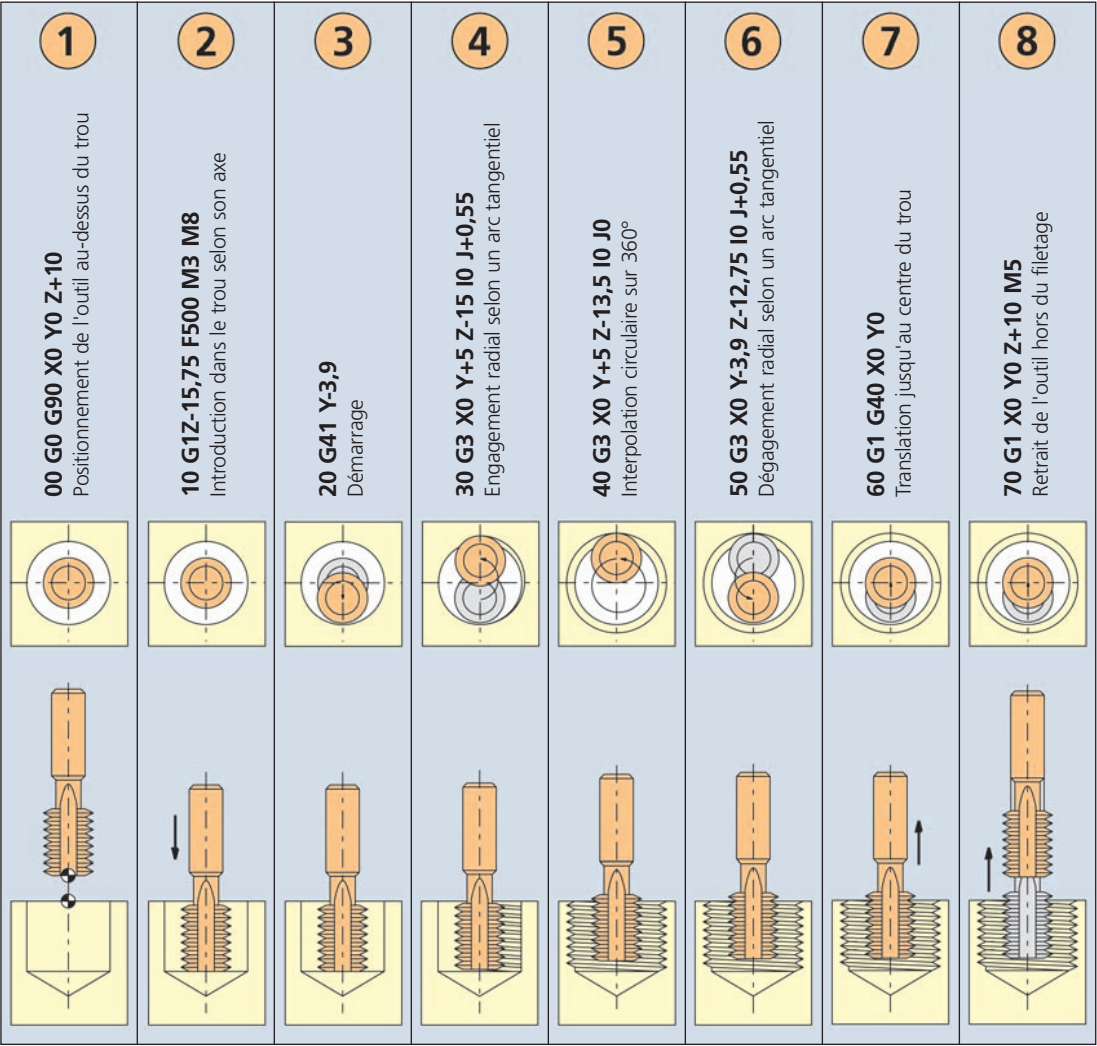


## Vitesse de rotation inconstante

La programmation d'une vitesse de rotation trop élevée peut générer des problèmes: si la vitesse de rotation sélectionnée ne peut pas être atteinte (en raison de l'inertie de la machine), cela peut entraîner la rupture précoce de l'outil ou des défauts d'usinage du filet. En y regardant plus précisément, une haute vitesse de rotation n'engendre souvent pas l'économie de temps espérée.

# Instructions techniques pour l'utilisation des fraises à fileter

## Cycle de fraisage de filet M10 en code ISO à titre d'exemple

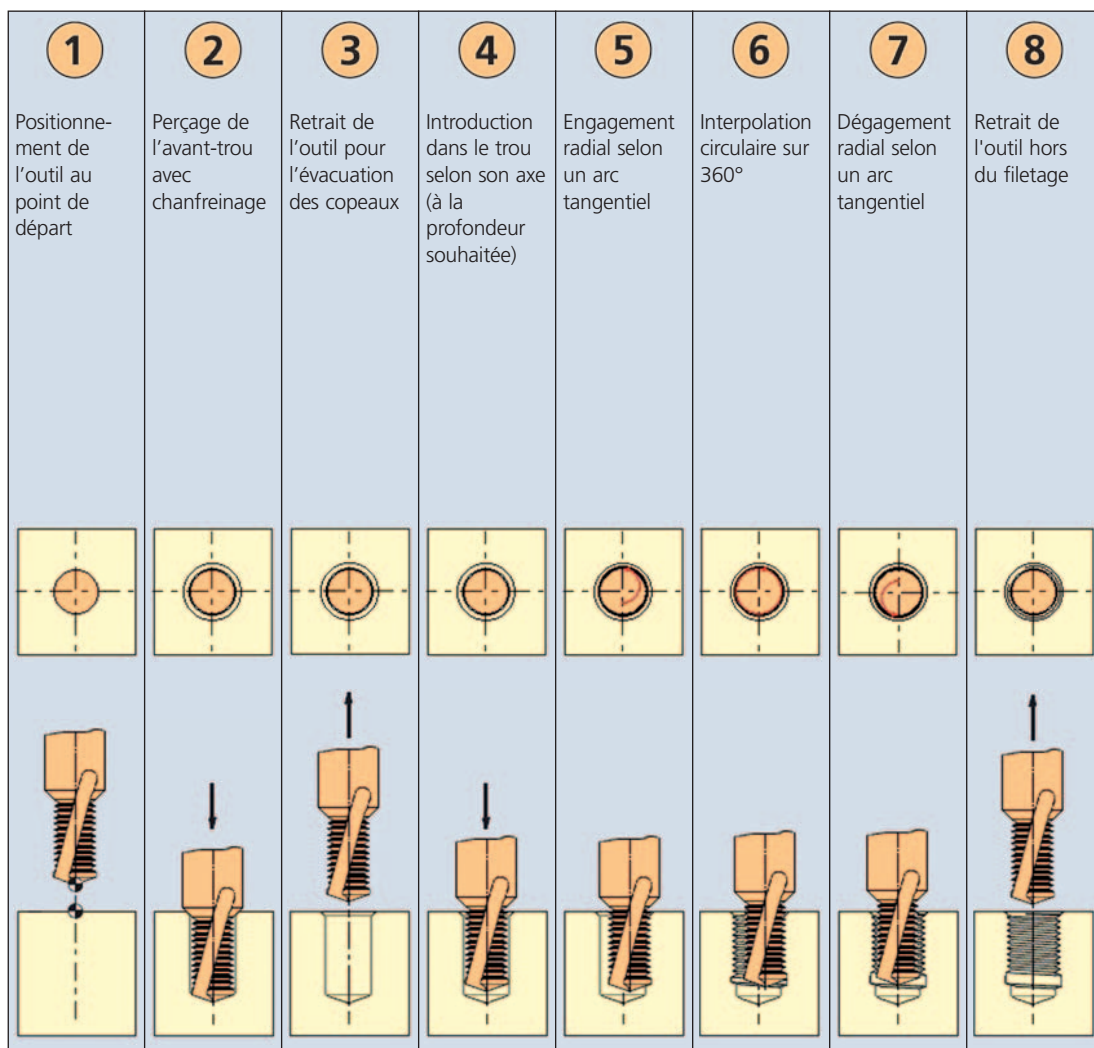


### Signification des commandes G et M utilisées

| G0                                    | G1                                           | G3                                               | G40                                    | G41                                                     | G90                             | G91                                  | M3                                              | M5                        | M8                 | M9                  |
|---------------------------------------|----------------------------------------------|--------------------------------------------------|----------------------------------------|---------------------------------------------------------|---------------------------------|--------------------------------------|-------------------------------------------------|---------------------------|--------------------|---------------------|
| Déplacement linéaire en marche rapide | Déplacement linéaire avec avance F en mm/min | Interpolation d'arc circulaire avec centre (I,J) | Annuler la correction du rayon d'outil | Correction du rayon d'outil (outil à gauche du contour) | Programmation en mesure absolue | Programmation en mesure incrémentale | Enclencher la rotation de l'arbre (à l'endroit) | Rotation de la broche OFF | Refroidissement ON | Refroidissement OFF |

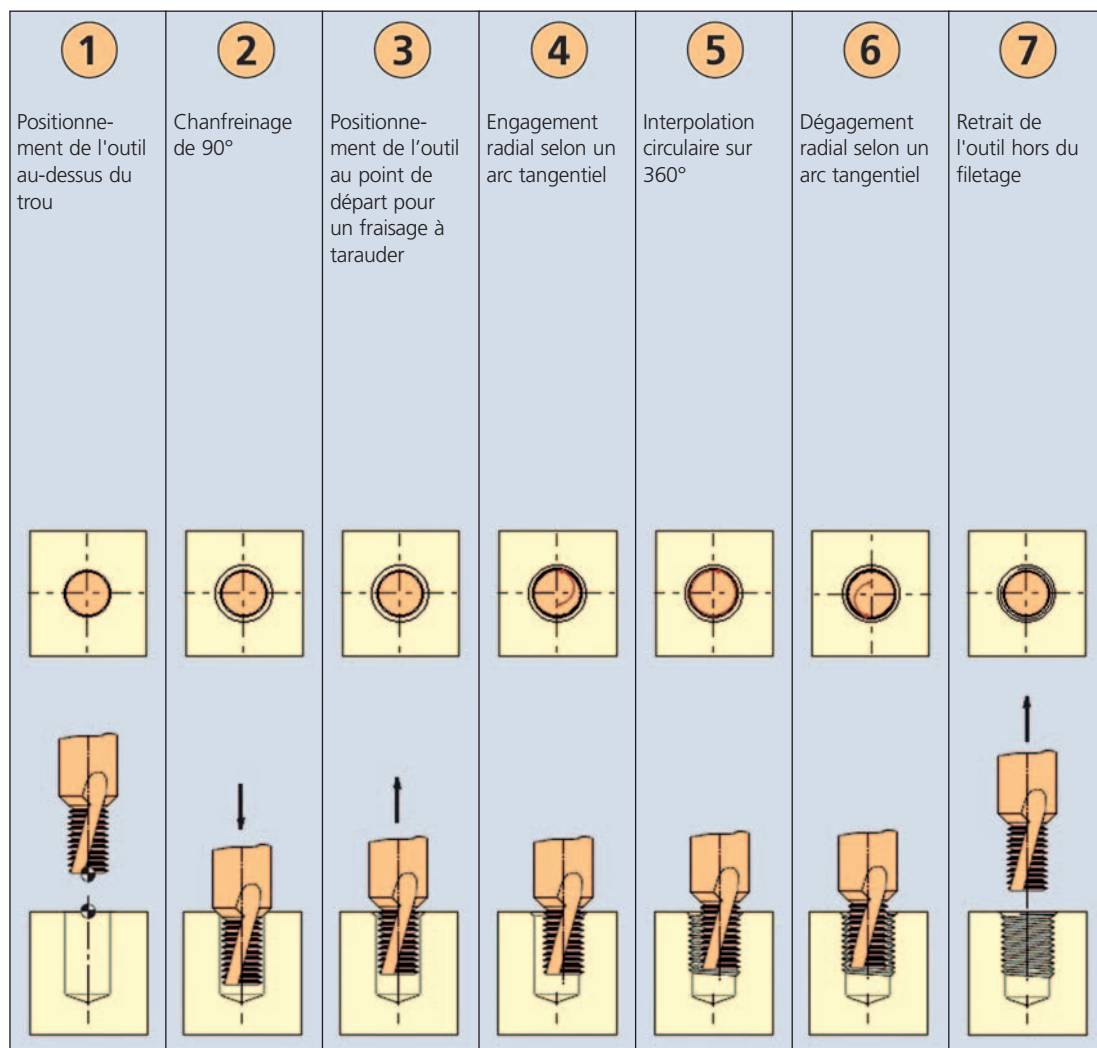
# Instructions techniques pour l'utilisation des fraises à fileter

## Cycle de fraisage à tarauder pour les fraises à percer-tarauder



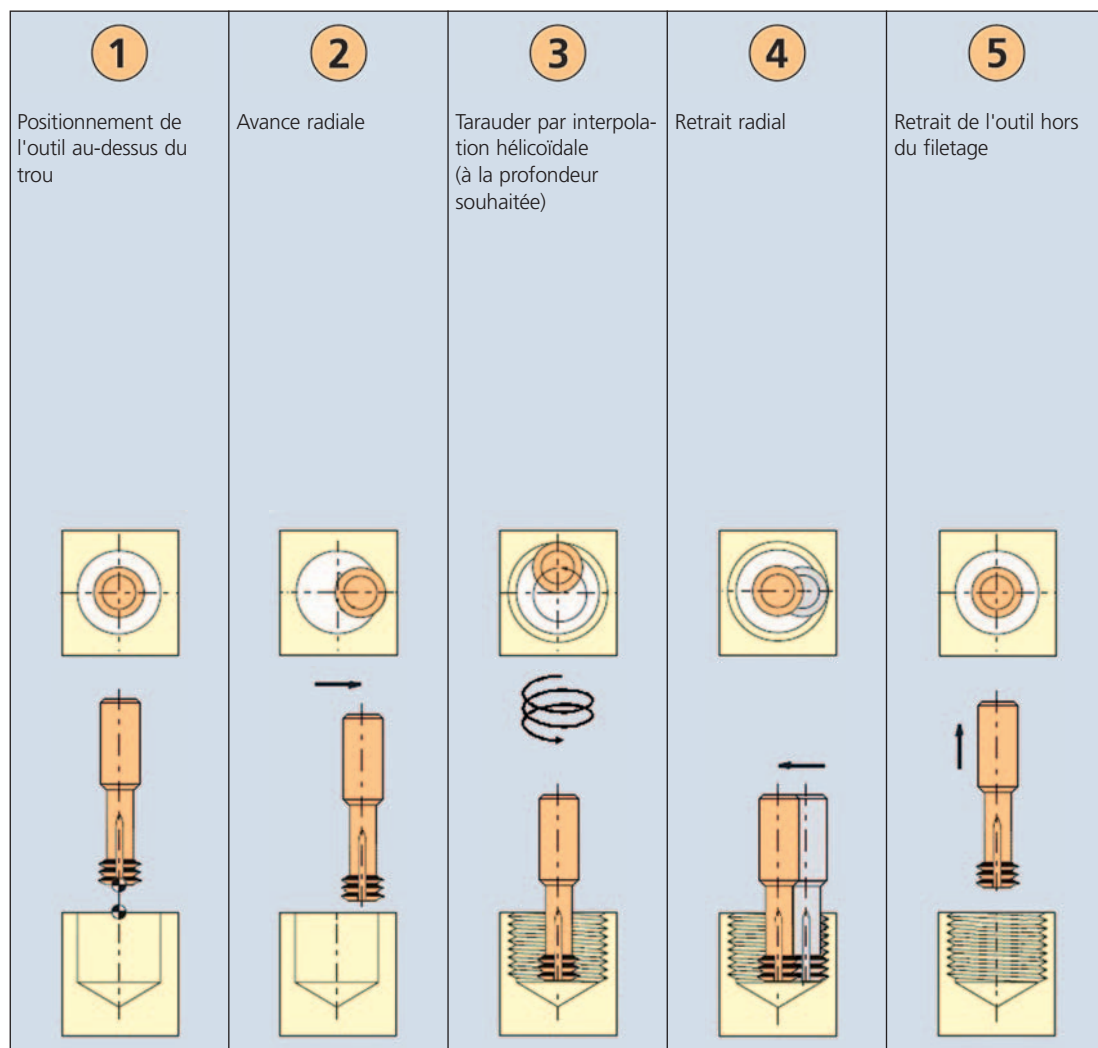
# Instructions techniques pour l'utilisation des fraises à fileter

## Cycle de fraisage à tarauder pour les fraises à fileter avec chanfrein



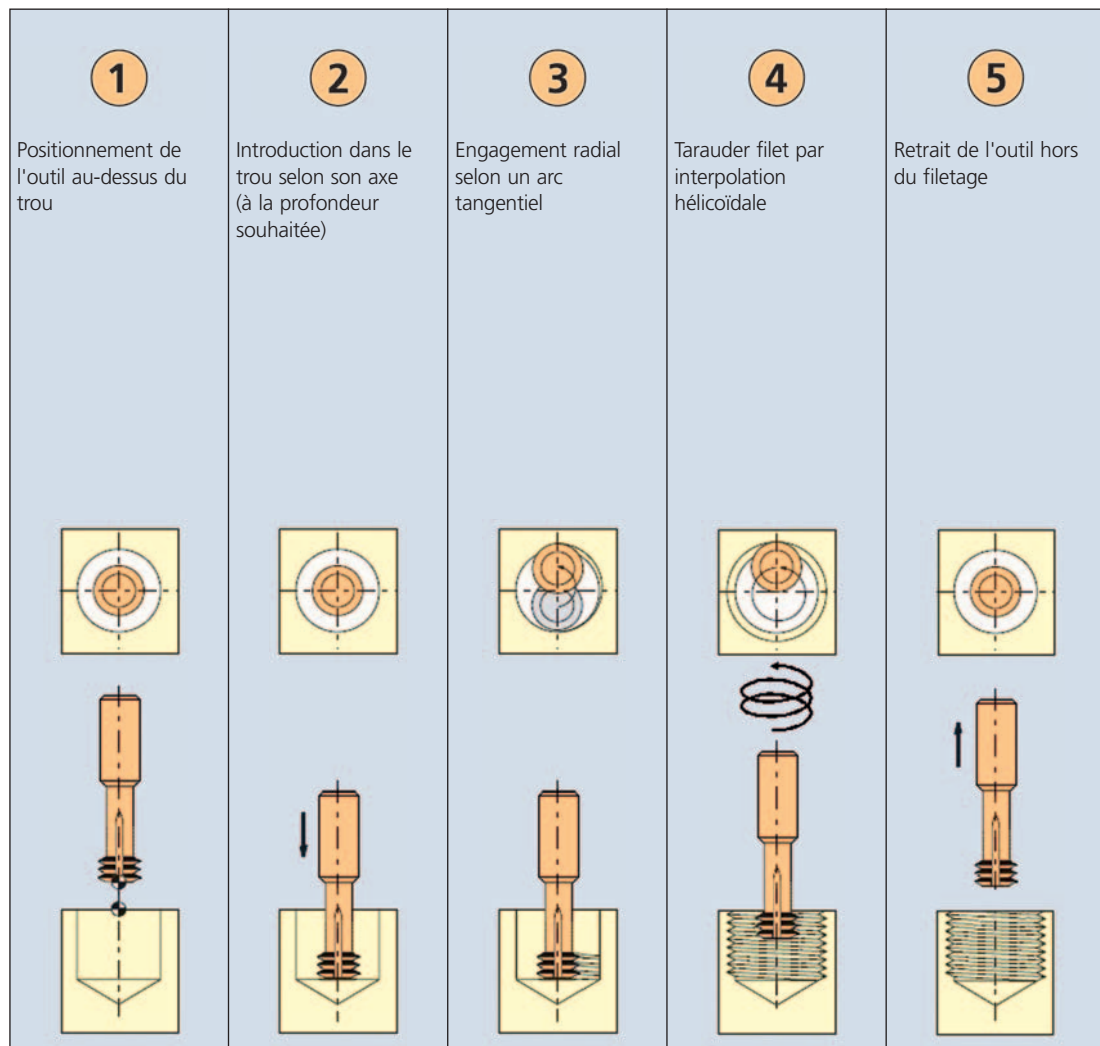
# Instructions techniques pour l'utilisation des fraises à fileter

## Cycle de fraisage à tarauder à droite (avance en oppositon) avec une fraise à tourbillonner



# Instructions techniques pour l'utilisation des fraises à fileter

Cycle de fraisage à tarauder à droite (dans le sens de l'avance) avec une fraise à tourbillonner

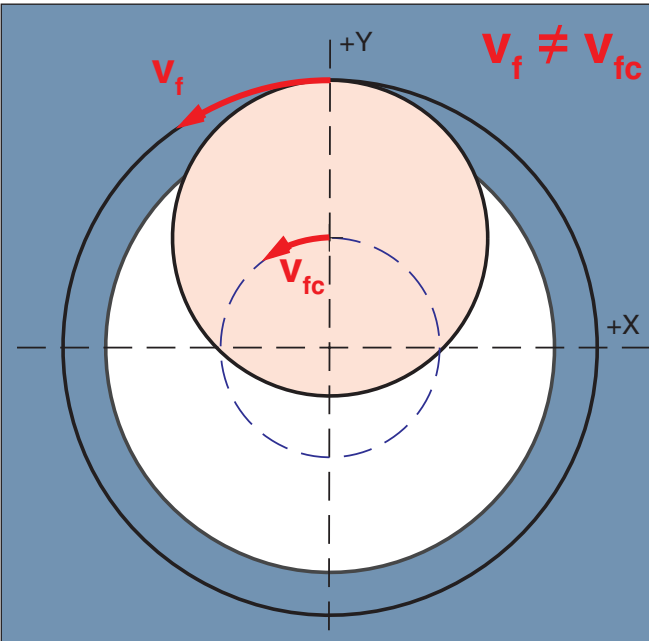


# Instructions techniques pour l'utilisation des fraises à fileter

## Détermination de la vitesse d'avance

$V_f \neq V_{fc}$

Conversion de la vitesse d'avance souhaitée sur la pièce à usiner  $v_f$  vers la vitesse d'avance à programmer  $v_{fc}$  au centre de l'outil:



**Pour filetage intérieur**

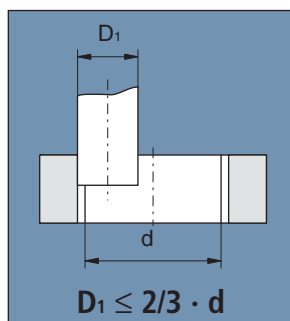
$$v_{fc} = \frac{v_f \cdot (d - D_1)}{d}$$

**Pour filetage extérieur**

$$v_{fc} = \frac{v_f \cdot (d + D_1)}{d}$$

Diamètre nominal  $d$  du filetage

## Prévention des distorsions de profil



Pour éviter les déformations de profil, le diamètre de la fraise  $D_1$  ne doit pas représenter plus de  $\frac{2}{3}$  du diamètre  $d$  de l'avant-trou.

La surépaisseur de l'avant-trou doit être comprise entre 0.1 et 0.3 mm.

Ainsi, le filetage est fraisé de façon irréprochable.

# Formules et abréviations

|                                                                                   |                                                                                                                                                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>a</b>                                                                          | Dimension du carré                                                                                                                                         |
| <b>d</b>                                                                          | Diamètre nominal du filetage                                                                                                                               |
| <b>d<sub>1</sub></b>                                                              | Diamètre de queue                                                                                                                                          |
| <b>d<sub>2</sub></b>                                                              | Diamètre de perçage pour la fraise à percer-tarauder                                                                                                       |
| <b>D<sub>1</sub></b>                                                              | Diamètre de la fraise à fileter                                                                                                                            |
| <b>d/D<sub>1</sub></b>                                                            | Rapports des diamètres pour déterminer la vitesse d'avance                                                                                                 |
| <b>Rk</b>                                                                         | Rayon de fraise corrigé pour tolérance d'écrou 6 H / ISO 2 (rayon de fraise à programmer dans la mémoire d'outils)                                         |
| <b>f<sub>z</sub></b>                                                              | Avance par dent                                                                                                                                            |
| <b>l</b>                                                                          | Longueur de la partie filetée pour les tarauds / tarauds à refouler                                                                                        |
| <b>l<sub>1</sub></b>                                                              | Longueur de dégagement pour les tarauds / tarauds à refouler ou longueur totale pour les fraises à fileter                                                 |
| <b>l<sub>2</sub></b>                                                              | Longueur de la partie filetée pour les fraises à fileter                                                                                                   |
| <b>l<sub>3</sub></b>                                                              | Longueur de rainure pour les tarauds ou longueur de dégagement pour les fraises à fileter                                                                  |
| <b>L</b>                                                                          | Longueur totale pour les tarauds / tarauds à refouler                                                                                                      |
| <b>L<sub>K</sub></b>                                                              | Profondeur de chanfreinage pour les fraises à fileter avec chanfrein                                                                                       |
| <b>n</b>                                                                          | Nombre de tours                                                                                                                                            |
| <b>P</b>                                                                          | Pas du filetage                                                                                                                                            |
| <b>v<sub>c</sub></b>                                                              | Vitesse de coupe                                                                                                                                           |
| <b>v<sub>f</sub></b>                                                              | Vitesse d'avance                                                                                                                                           |
| <b>v<sub>fc</sub></b>                                                             | Vitesse d'avance du centre d'outil                                                                                                                         |
|   | Nombre de dents pour les tarauds et les fraises à fileter                                                                                                  |
|  | Nombre des arêtes de forme pour tarauds à refouler                                                                                                         |
| <b>Δ</b>                                                                          | Différence entre diamètre du profil, de l'extérieur et du noyau de l'outil de taraudage, par rapport de la classe d'application 2 (ISO 2) selon DIN 22857. |
| <b>R<sub>m</sub></b>                                                              | Résistance à la traction mécanique                                                                                                                         |
| <b>HRC</b>                                                                        | Dureté selon Rockwell C                                                                                                                                    |
| <b>HV</b>                                                                         | Dureté selon Vickers                                                                                                                                       |
| <b>HB</b>                                                                         | Dureté selon Brinell                                                                                                                                       |

Nombre de tours

$$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \left[ \frac{1}{\text{min}} \right]$$

Vitesse de coupe

$$v_c = \frac{d \cdot \pi \cdot n}{1000} \left[ \frac{\text{m}}{\text{min}} \right]$$

Vitesse d'avance

$$v_f = P \cdot n \left[ \frac{\text{mm}}{\text{min}} \right]$$



# Diamètres de perçage

| M                                                                                 |      |               |          |                      |
|-----------------------------------------------------------------------------------|------|---------------|----------|----------------------|
|  |      |               |          |                      |
| ø                                                                                 | P    | Diamètre max. | Standard | Matériaux critiques* |
| 1.0                                                                               | 0.25 | 0.785         | 0.75     | 0.80 *               |
| 1.2                                                                               | 0.25 | 0.985         | 0.95     | 1.00 *               |
| 1.4                                                                               | 0.30 | 1.142         | 1.10     | 1.15 *               |
| 1.6                                                                               | 0.35 | 1.321         | 1.25     | 1.30                 |
| 1.7                                                                               | 0.35 | 1.421         | 1.35     | 1.40                 |
| 1.8                                                                               | 0.35 | 1.521         | 1.45     | 1.50                 |
| 2.0                                                                               | 0.40 | 1.679         | 1.60     | 1.70                 |
| 2.2                                                                               | 0.45 | 1.838         | 1.75     | 1.85 *               |
| 2.3                                                                               | 0.40 | 1.979         | 1.90     | 1.95                 |
| 2.5                                                                               | 0.45 | 2.138         | 2.05     | 2.10                 |
| 2.6                                                                               | 0.45 | 2.238         | 2.15     | 2.20                 |
| 3.0                                                                               | 0.50 | 2.599         | 2.50     | 2.60 *               |
| 3.5                                                                               | 0.60 | 3.010         | 2.90     | 3.00                 |
| 4.0                                                                               | 0.70 | 3.422         | 3.30     | 3.40                 |
| 4.5                                                                               | 0.75 | 3.878         | 3.75     | 3.90 *               |
| 5.0                                                                               | 0.80 | 4.334         | 4.20     | 4.30                 |
| 6.0                                                                               | 1.00 | 5.153         | 5.00     | 5.10                 |
| 7.0                                                                               | 1.00 | 6.153         | 6.00     | 6.10                 |
| 8.0                                                                               | 1.25 | 6.912         | 6.80     | 6.90                 |
| 10.0                                                                              | 1.50 | 8.676         | 8.50     | 8.60                 |
| 12.0                                                                              | 1.75 | 10.441        | 10.20    | 10.40                |
| 14.0                                                                              | 2.00 | 12.210        | 12.00    | 12.20                |
| 16.0                                                                              | 2.00 | 14.210        | 14.00    | 14.20                |
| 18.0                                                                              | 2.50 | 15.744        | 15.50    | 15.70                |
| 20.0                                                                              | 2.50 | 17.744        | 17.50    | 17.70                |
| 22.0                                                                              | 2.50 | 19.744        | 19.50    | 19.70                |
| 24.0                                                                              | 3.00 | 21.252        | 21.00    | 21.20                |
| 27.0                                                                              | 3.00 | 24.252        | 24.00    | 24.20                |
| 30.0                                                                              | 3.50 | 26.771        | 26.50    | 26.70                |
| 33.0                                                                              | 3.50 | 29.771        | 29.50    | 29.70                |
| 36.0                                                                              | 4.00 | 32.270        | 32.00    | 32.20                |
| 39.0                                                                              | 4.00 | 35.270        | 35.00    | 35.20                |
| 42.0                                                                              | 4.50 | 37.799        | 37.50    | 37.70                |
|                                                                                   |      |               |          |                      |
|                                                                                   |      |               |          |                      |
|                                                                                   |      |               |          |                      |
|                                                                                   |      |               |          |                      |

| MF                                                                                  |      |               |          |                      |
|-------------------------------------------------------------------------------------|------|---------------|----------|----------------------|
|  |      |               |          |                      |
| ø                                                                                   | P    | Diamètre max. | Standard | Matériaux critiques* |
| 2.5                                                                                 | 0.35 | 2.221         | 2.15     | 2.20                 |
| 3.0                                                                                 | 0.35 | 2.721         | 2.65     | 2.70                 |
| 3.5                                                                                 | 0.35 | 3.221         | 3.15     | 3.20                 |
| 4.0                                                                                 | 0.50 | 3.599         | 3.50     | 3.60 *               |
| 5.0                                                                                 | 0.50 | 4.599         | 4.50     | 4.60 *               |
| 6.0                                                                                 | 0.50 | 5.599         | 5.50     | 5.60 *               |
| 8.0                                                                                 | 0.50 | 7.599         | 7.50     | 7.60 *               |
| 10.0                                                                                | 0.50 | 9.599         | 9.50     | 9.60 *               |
| 6.0                                                                                 | 0.75 | 5.378         | 5.20     | 5.30                 |
| 7.0                                                                                 | 0.75 | 6.378         | 6.25     | 6.30                 |
| 8.0                                                                                 | 0.75 | 7.378         | 7.20     | 7.30                 |
| 10.0                                                                                | 0.75 | 9.378         | 9.20     | 9.30                 |
| 12.0                                                                                | 0.75 | 11.378        | 11.30    | 11.40 *              |
| 14.0                                                                                | 0.75 | 13.378        | 13.30    | 13.40 *              |
| 16.0                                                                                | 0.75 | 15.378        | 15.30    | 15.40 *              |
| 8.0                                                                                 | 1.00 | 7.153         | 7.00     | 7.10                 |
| 9.0                                                                                 | 1.00 | 8.153         | 8.00     | 8.10                 |
| 10.0                                                                                | 1.00 | 9.153         | 9.00     | 9.10                 |
| 12.0                                                                                | 1.00 | 11.153        | 11.00    | 11.10                |
| 13.0                                                                                | 1.00 | 12.153        | 12.00    | 12.10                |
| 14.0                                                                                | 1.00 | 13.153        | 13.00    | 13.10                |
| 15.0                                                                                | 1.00 | 14.153        | 14.00    | 14.10                |
| 16.0                                                                                | 1.00 | 15.153        | 15.00    | 15.10                |
| 17.0                                                                                | 1.00 | 16.153        | 16.00    | 16.10                |
| 18.0                                                                                | 1.00 | 17.153        | 17.00    | 17.10                |
| 20.0                                                                                | 1.00 | 19.153        | 19.00    | 19.10                |
| 10.0                                                                                | 1.25 | 8.912         | 8.80     | 8.90                 |
| 12.0                                                                                | 1.25 | 10.912        | 10.80    | 10.90                |
| 14.0                                                                                | 1.25 | 12.912        | 12.80    | 12.90                |
| 16.0                                                                                | 1.25 | 14.912        | 14.80    | 14.90                |
| 12.0                                                                                | 1.50 | 10.676        | 10.50    | 10.70 *              |
| 14.0                                                                                | 1.50 | 12.676        | 12.50    | 12.70 *              |
| 16.0                                                                                | 1.50 | 14.676        | 14.50    | 14.70 *              |
| 18.0                                                                                | 1.50 | 16.676        | 16.50    | 16.70 *              |
| 20.0                                                                                | 1.50 | 18.676        | 18.50    | 18.70 *              |
| 22.0                                                                                | 1.50 | 20.676        | 20.50    | 20.70 *              |
| 24.0                                                                                | 1.50 | 22.676        | 22.50    | 22.70 *              |

\* La dimension donnée est hors norme

# Diamètres de perçage

**MJ**



| ø    | P    | Diamètre max. | Standard | Matériaux critiques* |
|------|------|---------------|----------|----------------------|
| 2.0  | 0.40 | 1.722         | 1.65     | 1.70                 |
| 2.5  | 0.45 | 2.187         | 2.10     | 2.20 *               |
| 3.0  | 0.50 | 2.653         | 2.60     | 2.65                 |
| 4.0  | 0.70 | 3.498         | 3.40     | 3.50 *               |
| 5.0  | 0.80 | 4.421         | 4.30     | 4.40                 |
| 6.0  | 1.00 | 5.216         | 5.10     | 5.20                 |
| 8.0  | 1.00 | 7.216         | 7.10     | 7.20                 |
| 10.0 | 1.25 | 8.994         | 8.90     | 9.00 *               |

**Rc**

Rc 1:16 Aléser le perçage avec un alésoir conique 1:16



| ø    | P(TPI) | ø     | D max  | D min  | L min |
|------|--------|-------|--------|--------|-------|
| 1/16 | 28     | 6.10  | 6.605  | 6.515  | 11.90 |
| 1/8  | 28     | 8.10  | 8.615  | 8.525  | 11.90 |
| 1/4  | 19     | 10.80 | 11.505 | 11.395 | 17.70 |
| 3/8  | 19     | 14.30 | 15.005 | 14.895 | 18.10 |
| 1/2  | 14     | 17.80 | 18.695 | 18.565 | 24.00 |
| 3/4  | 14     | 23.00 | 24.185 | 24.055 | 25.30 |

**G**



| ø   | P  | Diamètre max. | Standard | Matériaux critiques* |
|-----|----|---------------|----------|----------------------|
| 1/8 | 28 | 8.848         | 8.80     | 8.85 *               |
| 1/4 | 19 | 11.890        | 11.80    | 11.90 *              |
| 3/8 | 19 | 15.395        | 15.25    | 15.40 *              |
| 1/2 | 14 | 19.172        | 19.00    | 19.20 *              |
| 5/8 | 14 | 21.128        | 21.00    | 21.10                |
| 3/4 | 14 | 24.658        | 24.50    | 24.60                |

**BSW**



| ø    | P  | Diamètre max. | Standard | Matériaux critiques* |
|------|----|---------------|----------|----------------------|
| 1/8  | 40 | 2.591         | 2.50     | 2.60 *               |
| 3/16 | 24 | 3.745         | 3.60     | 3.70                 |
| 1/4  | 20 | 5.156         | 5.10     | 5.10                 |
| 5/16 | 18 | 6.588         | 6.50     | 6.60 *               |
| 3/8  | 16 | 7.988         | 7.90     | 8.00 *               |
| 7/16 | 14 | 9.332         | 9.20     | 9.30                 |
| 1/2  | 12 | 10.589        | 10.50    | 10.60 *              |
| 5/8  | 11 | 13.558        | 13.50    | 13.50                |
| 3/4  | 10 | 16.484        | 16.20    | 16.50 *              |
| 7/8  | 9  | 19.355        | 19.20    | 19.30                |
| 1    | 8  | 22.1492       | 22.00    | 22.10                |

**Rp**



| ø   | P  | Diamètre max. | Standard | Matériaux critiques* |
|-----|----|---------------|----------|----------------------|
| 1/8 | 28 | 8.637         | 8.60     | 8.60                 |
| 1/4 | 19 | 11.549        | 11.50    | 11.50                |
| 3/8 | 19 | 15.054        | 15.00    | 15.00                |
| 1/2 | 14 | 18.773        | 18.50    | 18.70                |
| 3/4 | 14 | 24.259        | 24.00    | 24.20                |

**W<sub>zyl.</sub>**

perçage cylindrique



| ø     | P  | Diamètre max. | Standard | Matériaux critiques* |
|-------|----|---------------|----------|----------------------|
| 21.80 | 14 | 20.066        | 19.80    | 20.00                |
| 24.32 | 14 | 22.586        | 22.30    | 22.50                |

**W<sub>kon.</sub>**

W kon 3:25 Aléser le perçage avec un alésoir conique 3:25



| ø     | P(TPI) | ø     | D max  | D min  | L min |
|-------|--------|-------|--------|--------|-------|
| 19.80 | 14     | 14.60 | 16.880 | 16.760 | 23.50 |
| 28.80 | 14     | 22.60 | 25.480 | 25.360 | 28.50 |

\* La dimension donnée est hors norme

# Diamètres de perçage

## UNC



| ø    | P  | Diamètre max. | Standard | Matériaux critiques* |
|------|----|---------------|----------|----------------------|
| 1    | 64 | 1.582         | 1.55     | 1.60 *               |
| 2    | 56 | 1.872         | 1.85     | 1.90 *               |
| 3    | 48 | 2.146         | 2.10     | 2.15 *               |
| 4    | 40 | 2.385         | 2.35     | 2.40 *               |
| 5    | 40 | 2.697         | 2.65     | 2.70 *               |
| 6    | 32 | 2.896         | 2.85     | 2.90 *               |
| 8    | 32 | 3.531         | 3.50     | 3.50                 |
| 10   | 24 | 3.962         | 3.90     | 4.00 *               |
| 12   | 24 | 4.597         | 4.50     | 4.60 *               |
| 1/4  | 20 | 5.258         | 5.10     | 5.20                 |
| 5/16 | 18 | 6.731         | 6.60     | 6.70                 |
| 3/8  | 16 | 8.153         | 8.00     | 8.10                 |
| 7/16 | 14 | 9.550         | 9.40     | 9.50                 |
| 1/2  | 13 | 11.024        | 10.80    | 11.00                |
| 9/16 | 12 | 12.446        | 12.20    | 12.40                |
| 5/8  | 11 | 13.868        | 13.50    | 13.80                |
| 3/4  | 10 | 16.840        | 16.50    | 16.80                |
| 7/8  | 9  | 19.761        | 19.50    | 19.70                |
| 1    | 8  | 22.601        | 22.30    | 22.60                |

## UNF



| ø    | P  | Diamètre max. | Standard | Matériaux critiques* |
|------|----|---------------|----------|----------------------|
| 0    | 80 | 1.306         | 1.25     | 1.30                 |
| 1    | 72 | 1.613         | 1.55     | 1.60                 |
| 2    | 64 | 1.913         | 1.85     | 1.90                 |
| 3    | 56 | 2.197         | 2.15     | 2.20 *               |
| 4    | 48 | 2.459         | 2.40     | 2.45                 |
| 5    | 44 | 2.741         | 2.70     | 2.75 *               |
| 6    | 40 | 3.023         | 2.95     | 3.00                 |
| 8    | 36 | 3.607         | 3.50     | 3.60                 |
| 10   | 32 | 4.166         | 4.10     | 4.20 *               |
| 12   | 28 | 4.727         | 4.60     | 4.70                 |
| 1/4  | 28 | 5.588         | 5.50     | 5.60 *               |
| 5/16 | 24 | 7.036         | 6.90     | 7.00                 |
| 3/8  | 24 | 8.636         | 8.50     | 8.60                 |
| 7/16 | 20 | 10.033        | 9.90     | 10.00                |
| 1/2  | 20 | 11.608        | 11.50    | 11.60                |
| 9/16 | 18 | 13.081        | 12.90    | 13.00                |
| 5/8  | 18 | 14.681        | 14.50    | 14.70 *              |
| 3/4  | 16 | 17.678        | 17.50    | 17.70 *              |
| 7/8  | 14 | 20.675        | 20.50    | 20.70 *              |
| 1    | 12 | 23.571        | 23.30    | 23.50                |

## UNJC



| ø    | P  | Diamètre max. | Standard | Matériaux critiques* |
|------|----|---------------|----------|----------------------|
| 4    | 40 | 2.392         | 2.30     | 2.40 *               |
| 6    | 32 | 2.938         | 2.85     | 2.90                 |
| 8    | 32 | 3.599         | 3.50     | 3.60 *               |
| 10   | 24 | 4.064         | 3.90     | 4.00                 |
| 1/4  | 20 | 5.387         | 5.25     | 5.40 *               |
| 5/16 | 18 | 6.832         | 6.70     | 6.80                 |
| 3/8  | 16 | 8.257         | 8.10     | 8.20                 |

## UNJF



| ø    | P  | Diamètre max. | Standard | Matériaux critiques* |
|------|----|---------------|----------|----------------------|
| 6    | 40 | 3.053         | 3.00     | 3.05                 |
| 8    | 36 | 3.662         | 3.55     | 3.60                 |
| 10   | 32 | 4.254         | 4.15     | 4.20                 |
| 1/4  | 28 | 5.661         | 5.55     | 5.60                 |
| 5/16 | 24 | 7.109         | 7.00     | 7.10                 |
| 3/8  | 24 | 8.679         | 8.60     | 8.70 *               |

## UNEF



| ø     | P  | Diamètre max. | Standard | Matériaux critiques* |
|-------|----|---------------|----------|----------------------|
| 1/4   | 32 | 5.689         | 5.60     | 5.70 *               |
| 5/16  | 32 | 7.264         | 7.20     | 7.30 *               |
| 3/8   | 32 | 8.864         | 8.80     | 8.90 *               |
| 7/16  | 28 | 10.337        | 10.20    | 10.30                |
| 1/2   | 28 | 11.938        | 11.80    | 11.90                |
| 9/16  | 24 | 13.385        | 13.20    | 13.40 *              |
| 5/8   | 24 | 14.986        | 14.80    | 15.00 *              |
| 11/16 | 24 | 16.560        | 16.40    | 16.50                |
| 3/4   | 20 | 17.957        | 17.80    | 18.00 *              |
| 7/8   | 20 | 21.132        | 21.00    | 21.10                |
| 1     | 20 | 24.307        | 24.20    | 24.30                |

\* La dimension donnée est hors norme



Tableau de comparaison de la dureté (R<sub>m</sub> → HV10 → HB → HRC)

| R <sub>m</sub> [N/mm²] | HV 10 | HB  | HRC | R <sub>m</sub> [N/mm²] | HV 10 | HB  | HRC |
|------------------------|-------|-----|-----|------------------------|-------|-----|-----|
| 240                    | 75    | 71  |     | 920                    | 287   | 273 | 28  |
| 255                    | 80    | 76  |     | 940                    | 293   | 278 | 29  |
| 270                    | 85    | 81  |     | 970                    | 302   | 287 | 30  |
| 285                    | 90    | 86  |     | 995                    | 310   | 295 | 31  |
| 305                    | 95    | 90  |     | 1020                   | 317   | 301 | 32  |
| 320                    | 100   | 95  |     | 1050                   | 327   | 311 | 33  |
| 335                    | 105   | 100 |     | 1080                   | 336   | 319 | 34  |
| 350                    | 110   | 105 |     | 1110                   | 345   | 328 | 35  |
| 370                    | 115   | 109 |     | 1140                   | 355   | 337 | 36  |
| 385                    | 120   | 114 |     | 1170                   | 364   | 346 | 37  |
| 400                    | 125   | 119 |     | 1200                   | 373   | 354 | 38  |
| 415                    | 130   | 124 |     | 1230                   | 382   | 363 | 39  |
| 430                    | 135   | 128 |     | 1260                   | 392   | 372 | 40  |
| 450                    | 140   | 133 |     | 1300                   | 403   | 383 | 41  |
| 465                    | 145   | 138 |     | 1330                   | 413   | 393 | 42  |
| 480                    | 150   | 143 |     | 1360                   | 423   | 402 | 43  |
| 495                    | 155   | 147 |     | 1400                   | 434   | 413 | 44  |
| 510                    | 160   | 152 |     | 1440                   | 446   | 424 | 45  |
| 530                    | 165   | 157 |     | 1480                   | 458   | 435 | 46  |
| 545                    | 170   | 162 |     | 1530                   | 473   | 449 | 47  |
| 560                    | 175   | 166 |     | 1570                   | 484   | 460 | 48  |
| 575                    | 180   | 171 |     | 1620                   | 497   | 472 | 49  |
| 595                    | 185   | 176 |     | 1680                   | 514   | 488 | 50  |
| 610                    | 190   | 181 |     | 1730                   | 527   | 501 | 51  |
| 625                    | 195   | 185 |     | 1790                   | 544   | 517 | 52  |
| 640                    | 200   | 190 |     | 1845                   | 560   | 532 | 53  |
| 660                    | 205   | 195 |     | 1910                   | 578   | 549 | 54  |
| 675                    | 210   | 199 |     | 1980                   | 596   | 567 | 55  |
| 690                    | 215   | 204 |     | 2050                   | 615   | 584 | 56  |
| 705                    | 220   | 209 |     | 2140                   | 639   | 607 | 57  |
| 720                    | 225   | 214 |     |                        | 655   | 622 | 58  |
| 740                    | 230   | 219 |     |                        | 675   |     | 59  |
| 755                    | 235   | 223 |     |                        | 698   |     | 60  |
| 770                    | 240   | 228 |     |                        | 720   |     | 61  |
| 785                    | 245   | 233 |     |                        | 745   |     | 62  |
| 800                    | 250   | 238 | 22  |                        | 773   |     | 63  |
| 820                    | 255   | 242 | 23  |                        | 800   |     | 64  |
| 835                    | 260   | 247 | 24  |                        | 829   |     | 65  |
| 860                    | 268   | 255 | 25  |                        | 864   |     | 66  |
| 870                    | 272   | 258 | 26  |                        | 900   |     | 67  |
| 900                    | 280   | 266 | 27  |                        | 940   |     | 68  |

# Conditions générales

## 1. Généralités

- 1.1 Le contrat est conclu par la confirmation écrite (confirmation de commande) de Fraisa SA ou de ses filiales (ci-après "fournisseur") par laquelle la commande est acceptée.
- 1.2 Les divergences par rapport à la commande dans la confirmation de commande s'intègrent au contenu du contrat dans la mesure où le mandant ne les récusé pas par écrit dans un délai de 5 jours ouvrés à compter de la réception de la confirmation de commande. Les offres, particulièrement celles présentes dans des listes de prix, prospectus, etc. ne contenant aucun délai d'acceptation, sont sans engagement.
- 1.3 Les présentes conditions de livraison sont obligatoires si elles sont déclarées applicables dans l'offre ou dans la confirmation de commande. D'autres conditions différentes du mandant ne sont valides que si elles ont été expressément acceptées par écrit par le fournisseur.
- 1.4 Tous les accords et déclarations pertinentes des parties contractantes nécessitent la forme écrite pour être valables.
- 1.5 Si une disposition des présentes conditions de livraison s'avérerait en tout ou partie caduque, les parties contractantes remplaceront alors cette disposition par une disposition nouvelle se rapprochant le plus possible de l'objectif économique recherché.

## 2. Volume des livraisons et prestations

Les livraisons et les prestations du fournisseur sont indiquées dans la confirmation de commande, y compris les annexes éventuelles à celle-ci de manière limitative. Le fournisseur est autorisé à procéder à des modifications générant des améliorations dans la mesure où elles n'entraînent pas d'augmentation des prix.

## 3. Prospectus, catalogues et documents techniques

Sans accords ultérieurs, les prospectus et les catalogues n'ont pas de valeur contraignante. Les données des documents techniques ne sont obligatoires que si elles sont expressément garanties.

## 4. Prix

- 4.1 Tous les prix s'entendent - en l'absence d'un autre accord - nets, départ usine, sans emballage, en francs suisses librement disponibles, ou dans la devise nationale des filiales, sans déductions quelles qu'elles soient.
- 4.2 Tous les frais annexes, par exemple pour le fret, l'assurance, les autorisations d'exportation, d'importation, et autres autorisations ainsi que des certifications sont à la charge du mandant.
- 4.3 De même, le mandant doit supporter toutes les sortes d'impôts (en particulier la TVA), redevances, taxes, droits de douane et similaires qui sont prélevées en rapport avec le contrat, ou les rembourser au fournisseur contre un justificatif si celui-ci en a l'obligation de prestation.

## 5. Conditions de paiement

- 5.1 Le mandant doit effectuer les paiements conformé-

ment aux conditions de paiement convenues au domicile du fournisseur, sans déduction d'escompte, frais, impôts, redevances, taxes, droits de douane et similaires. L'obligation de paiement est remplie si le montant convenu a été mis à disposition du fournisseur au domicile du fournisseur. Le délai de paiement est de 30 jours à compter de la date de facturation.

- 5.2 Le délai de paiement ou les délais de paiement convenus séparément doivent aussi être respectés si le transport, la livraison ou l'acceptation de la livraison sont retardées ou rendues impossibles pour des motifs dont le fournisseur n'est pas responsable ou si des parties non essentielles manquent à la livraison ou si des travaux complémentaires s'avèrent nécessaires et rendent impossible l'utilisation de la livraison.
- 5.3 Si le mandant ne respecte pas le délai de paiement ou les délais de paiement convenus séparément, il doit, sans avertissement, à compter de la date d'échéance, indiquer un intérêt qui s'applique aux taux d'intérêt usuels au domicile du mandant, cependant au moins 4% au-dessus du taux d'escompte respectif de la banque nationale suisse. L'indemnisation d'autres préjudices reste réservée.

## 6. Réserve de propriété

- 6.1 Le fournisseur reste propriétaire de toutes ses livraisons jusqu'à ce qu'il ait reçu l'intégralité des paiements prévus au contrat.
- 6.2 Le mandant est tenu de coopérer à des mesures nécessaires à la protection de la propriété du fournisseur; en particulier, il donne les pleins pouvoirs au fournisseur, à la conclusion du contrat d'achat, pour réaliser, au frais du mandant, l'inscription ou la prénation de la réserve de propriété dans des registres ou des livres publics ou similaires conformément aux lois nationales concernées et pour effectuer toutes les formalités à cet égard.
- 6.3 Le mandant entretiendra les objets livrés à ses frais pendant la durée de la réserve de propriété et en faveur du Fournisseur, contre le vol, le bris, l'incendie, les inondations et d'autres risques. En outre, il prendra toutes les mesures afin que la prétention à la propriété du fournisseur ne soit ni affectée, ni infirmée.

## 7. Délai de livraison

- 7.1 Le fournisseur s'efforce de respecter le délai de livraison fixé dans la confirmation de commande. Le délai de livraison est respecté si l'avis de mise à disposition de l'envoi est envoyé au mandant jusqu'à son expiration.
- 7.2 Le respect du délai de livraison est la condition préalable de l'exécution totale des obligations contractuelles par le mandant.
- 7.3 Le délai de livraison se prolonge proportionnellement si des obstacles surviennent et que le fournisseur ne peut les écarter malgré la diligence requise, indépendamment du fait qu'ils surviennent chez lui, le mandant ou un tiers. De tels obstacles sont par exemple des épidémies, une mobilisation, une guerre, une insurrection,

- des accidents d'exploitation importants, des accidents, des conflits sociaux, un retard de livraison ou une livraison défectueuse des matières premières nécessaires et des produits semi-finis, des mesures prises par les autorités civiles ou des omissions ainsi que des phénomènes naturels.
- 7.4 Si, au lieu d'un délai de livraison, une date précise est convenue, celle-ci a la même signification que le dernier jour d'un délai de livraison. Les paragraphes 7.1 à 7.3 sont applicables de façon analogue.
- 7.5 En cas de retard de livraison, le mandant n'a aucun droit à des dommages-intérêts ou à d'autres prestations autres que celles qui sont expressément mentionnées dans ce paragraphe 7 ou stipulées dans un accord séparé. Cette restriction ne s'applique pas à une intention délictueuse ou à une négligence grave du fournisseur.
- 8. Reprise des marchandises**  
Pour des retours de marchandises usuels jusqu'à CHF 1000.–, nous devons imputer une réduction de 10% de la valeur de la marchandise, au minimum toutefois de CHF 30.– pour les dépenses de contrôle qui nous incombent. Pour des valeurs de reprise supérieures, il convient d'obtenir au préalable l'accord de FRAISA SA. Les réalisations spécifiques aux clients et les produits dotés d'inscriptions spéciales sont exclus de toute reprise.
- 9. Conditionnement**  
L'emballage est facturé séparément par le fournisseur et n'est pas repris.
- 10. Transfert des profits et des risques**  
10.1 Les profits et les risques sont transférés au mandant au plus tard au départ de la livraison départ usine.  
10.2 Si l'envoi est retardé à la requête du mandant ou pour d'autres motifs dont le fournisseur n'est pas responsable, le risque est transféré à la date prévue à l'origine pour la livraison départ usine. A partir de cette date, les livraisons sont stockées et assurées aux frais et aux risques du mandant.
- 11. Envoi, transport et assurance**  
11.1 Des souhaits spéciaux concernant l'expédition, le transport et l'assurance doivent être portés à la connaissance du fournisseur en temps voulu. Le transport est effectué aux frais et aux risques du mandant.  
11.2 Les réclamations relatives à l'expédition ou au transport doivent être adressées sans tarder par le mandant au dernier transporteur à la réception de la livraison ou des documents de fret.  
11.3 L'assurance couvrant les dommages de toute sorte doit être souscrite par le mandant.
- 12. Vérification et acceptation des livraisons**  
12.1 Le mandant doit vérifier les livraisons dans les huit jours suivant leur réception et informer le fournisseur par écrit des vices éventuels dans le même délai. S'il omet ceci, les livraisons sont réputées acceptées.  
12.2 Le fournisseur doit éliminer aussi rapidement que possible les vices indiqués conformément au paragraphe 12.1 - ou - selon son choix - remplacer les marchandises défectueuses.  
12.3 Le mandant n'a aucun droit et aucune prétention pour des vices de quelque sorte que ce soit sur les livraisons, autres que les droits et prétention expressément indiqués aux paragraphes 12 et 13 (Garantie, responsabilité en cas de vices).
- 13. Garantie, responsabilité en cas de vices**  
13.1 Le délai de garantie est de six mois. Il commence avec le départ des livraisons de l'usine. Pour les marchandises remplacées ou réparées, le délai de garantie commence à courir de nouveau et dure six mois à compter de l'envoi des marchandises de remplacement par le fournisseur. La garantie s'éteint précocement si le mandant ou des tiers entreprennent des modifications ou des réparations non conformes ou si le mandant, en cas de survenue d'un vice, ne prend pas immédiatement toutes les mesures adaptées pour atténuer ce dommage et ne donne pas l'opportunité au fournisseur d'éliminer le vice.  
13.2 Sont exclus de la garantie et de la responsabilité du fournisseur les dommages survenus de façon non démontrable en raison d'un mauvais matériau, d'une conception défectueuse ou d'une exécution défectueuse, par exemple suite à une usure naturelle, un entretien défectueux, un non-respect des instructions de service, une utilisation excessive, un consommable inadapté, des influences chimiques ou électrolytiques ainsi que pour d'autres motifs dont le fournisseur n'est pas responsable.  
13.3 Le mandant a exclusivement droit à un dédommagement ou une réparation des marchandises défectueuses. Le mandant n'a pas droit à d'autres prétentions, particulièrement à une indemnisation des dommages ou des dommages consécutifs aux défauts. En aucun cas le mandant ne peut prétendre à la réparation de dommages non survenus sur l'objet même de la livraison, notamment une interruption de la production, des pertes d'exploitation, une perte de commandes, un manque à gagner, ainsi que d'autres dommages directs ou indirects. L'exclusion de responsabilité ne s'applique pas à une intention délictueuse ou une négligence grave du fournisseur. Du reste, cette exclusion de responsabilité ne s'applique pas dans la mesure où un droit coercitif s'y oppose.
- 14. Juridiction et droit applicable**  
14.1 La juridiction pour le mandant et le fournisseur est le siège social du fournisseur. Ce dernier est cependant autorisé à poursuivre en justice le mandant à son domicile.  
14.2 La relation juridique est exclusivement soumise au droit du commerce national du fournisseur. Les dispositions de la Convention des Nations Unies sur les contrats de vente internationale de marchandises ne s'appliquent pas.

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(●) Représentations.

Vous trouvez votre interlocuteur sous [www.fraisa.com](http://www.fraisa.com).







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[illegible]



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|                      |                                                                                   | sans       | vaporisé  | TiCN      | TRIBO     | INTEGRAL  | F-DLC     | LONGCUT   | UNICUT-4X |
| Composition chimique |                                                                                   |            |           | TiCN      | TiAlN     | TiAlN     | DLC       | AlCrN     | TiAlCN    |
| Dureté [HV]          |                                                                                   |            |           | 3000      | 3000      | 3500      | 2800      | 3200      | 3200      |
| Temp. max. [°C]      |                                                                                   |            |           | 400       | 300       | 1000      | 500       | 1100      | 650       |
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| – 0591               | 157                                                                               |            |           | ●         |           |           |           |           |           |
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| – 0595               | 161                                                                               |            |           | ●         |           |           |           |           |           |
| – 0596               | 161                                                                               |            |           | ●         |           |           |           |           |           |
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| _ 1240       | 257 |            |          |      | ●     |          |       |         |           |
| _ 1241       | 259 |            |          |      | ●     |          |       |         |           |
| _ 1257       | 247 |            |          | ●    |       |          |       |         |           |
| _ 1258       | 249 |            |          | ●    |       |          |       |         |           |
| _ 1260       | 251 |            |          | ●    |       |          |       |         |           |
| _ 1260       | 261 |            |          |      | ●     |          |       |         |           |
| _ 1261       | 253 |            |          | ●    |       |          |       |         |           |
| _ 1261       | 263 |            |          |      | ●     |          |       |         |           |
| _ 1270       | 265 |            |          | ●    |       |          |       |         |           |
| _ 1271       | 267 |            |          | ●    |       |          |       |         |           |
| _ 1400       | 273 |            |          | ●    |       |          |       |         |           |
| _ 1402       | 293 |            |          |      |       | ●        |       |         |           |
| _ 1429       | 297 |            |          | ●    |       |          |       |         |           |
| _ 1440       | 287 |            |          |      | ●     |          |       |         |           |
| _ 1452       | 295 |            |          |      |       | ●        |       |         |           |
| _ 1472       | 277 |            |          | ●    |       |          |       |         |           |
| _ 1475       | 279 |            |          | ●    |       |          |       |         |           |
| _ 1475       | 289 |            |          |      | ●     |          |       |         |           |
| _ 1480       | 291 |            |          | ●    |       |          |       |         |           |
| _ 1482       | 281 |            |          | ●    |       |          |       |         |           |
| _ 1495       | 283 |            |          | ●    |       |          |       |         |           |
| _ 1602       | 321 |            |          |      |       | ●        |       |         |           |
| _ 1620       | 313 |            |          |      | ●     |          |       |         |           |
| _ 1621       | 315 |            |          |      | ●     |          |       |         |           |
| _ 1652       | 323 |            |          |      |       | ●        |       |         |           |
| _ 1687       | 305 |            |          | ●    |       |          |       |         |           |
| _ 1688       | 307 |            |          | ●    |       |          |       |         |           |
| _ 1690       | 309 |            |          | ●    |       |          |       |         |           |
| _ 1690       | 317 |            |          |      | ●     |          |       |         |           |
| _ 1691       | 311 |            |          | ●    |       |          |       |         |           |
| _ 1691       | 319 |            |          |      | ●     |          |       |         |           |
| _ 1699       | 325 | ●          |          |      |       |          |       |         |           |
| _ 1750       | 331 |            |          |      | ●     |          |       |         |           |
| _ 1751       | 331 |            |          |      | ●     |          |       |         |           |
| _ 1787       | 327 |            |          | ●    |       |          |       |         |           |
| _ 1788       | 327 |            |          | ●    |       |          |       |         |           |
| _ 1790       | 329 |            |          | ●    |       |          |       |         |           |
| _ 1790       | 333 |            |          |      | ●     |          |       |         |           |
| _ 1791       | 329 |            |          | ●    |       |          |       |         |           |
| _ 1791       | 333 |            |          |      | ●     |          |       |         |           |
| _ 1799       | 335 | ●          |          |      |       |          |       |         |           |
| _ 1830       | 339 |            |          |      | ●     |          |       |         |           |
| _ 2010       | 409 |            |          |      |       |          |       |         | ●         |
| _ 2060       | 411 |            |          |      |       |          |       |         | ●         |
| _ 2110       | 413 |            |          |      |       |          |       |         | ●         |
| _ 2200       | 415 |            |          |      |       |          |       |         | ●         |
| _ 2210       | 415 |            |          |      |       |          |       |         | ●         |
| _ 6100       | 359 |            |          | ●    |       |          |       |         |           |
| _ 6101       | 359 |            |          | ●    |       |          |       |         |           |
| _ 6300       | 189 |            |          | ●    |       |          |       |         |           |
| _ 6301       | 191 |            |          | ●    |       |          |       |         |           |
| _ 6350       | 193 |            |          | ●    |       |          |       |         |           |
| _ 6351       | 193 |            |          | ●    |       |          |       |         |           |
| _ 6500       | 179 |            |          | ●    |       |          |       |         |           |
| _ 6501       | 181 |            |          | ●    |       |          |       |         |           |
| _ 6550       | 183 |            |          | ●    |       |          |       |         |           |
| _ 6551       | 183 |            |          | ●    |       |          |       |         |           |
| _ 6900       | 163 |            |          | ●    |       |          |       |         |           |
| _ 6901       | 163 |            |          | ●    |       |          |       |         |           |
| _ 6910       | 255 |            |          | ●    |       |          |       |         |           |
| _ 6911       | 255 |            |          | ●    |       |          |       |         |           |
| _ 6916       | 285 |            |          | ●    |       |          |       |         |           |

| N° d'article |     | Revêtement |           |           |           |           |           |           |           |
|--------------|-----|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| INDEX        |     | <u>E</u>   | <u>EV</u> | <u>EH</u> | <u>ET</u> | <u>EI</u> | <u>EF</u> | <u>EL</u> | <u>EU</u> |
|              |     | sans       | vaporisé  | TiCN      | TRIBO     | INTEGRAL  | F-DLC     | LONGCUT   | UNICUT-4X |
| _ 10060      | 355 |            |           |           |           |           | ●         |           |           |
| _ 10061      | 357 |            |           |           |           |           | ●         |           |           |
| _ 10064      | 371 |            |           |           |           |           | ●         |           |           |
| _ 10065      | 371 |            |           |           |           |           | ●         |           |           |
| _ 10068      | 375 |            |           |           |           |           | ●         |           |           |
| _ 10070      | 365 |            |           | ●         |           |           |           |           |           |
| _ 10071      | 367 |            |           | ●         |           |           |           |           |           |
| _ 10072      | 369 |            |           | ●         |           |           |           |           |           |
| _ 10073      | 369 |            |           | ●         |           |           |           |           |           |
| _ 10074      | 373 |            |           | ●         |           |           |           |           |           |
| _ 10075      | 373 |            |           | ●         |           |           |           |           |           |
| _ 10078      | 377 |            |           | ●         |           |           |           |           |           |
| _ 10080      | 361 |            |           |           |           |           |           | ●         |           |
| _ 10081      | 363 |            |           |           |           |           |           | ●         |           |
| _ 10110      | 235 | ●          |           |           |           |           |           |           |           |
| _ 10114      | 239 | ●          |           |           |           |           |           |           |           |
| _ 10115      | 239 | ●          |           |           |           |           |           |           |           |
| _ 10118      | 227 | ●          |           |           |           |           |           |           |           |
| _ 10119      | 227 | ●          |           |           |           |           |           |           |           |
| _ 10122      | 223 | ●          |           |           |           |           |           |           |           |
| _ 10123      | 223 | ●          |           |           |           |           |           |           |           |
| _ 10214      | 237 | ●          |           |           |           |           |           |           |           |
| _ 10218      | 241 | ●          |           |           |           |           |           |           |           |
| _ 10219      | 241 | ●          |           |           |           |           |           |           |           |
| _ 10220      | 229 | ●          |           |           |           |           |           |           |           |
| _ 10221      | 229 | ●          |           |           |           |           |           |           |           |
| _ 10222      | 225 | ●          |           |           |           |           |           |           |           |
| _ 10223      | 225 | ●          |           |           |           |           |           |           |           |
| _ 10310      | 145 |            |           | ●         |           |           |           |           |           |
| _ 10311      | 145 |            |           | ●         |           |           |           |           |           |
| _ 10340      | 219 | ●          |           |           |           |           |           |           |           |
| _ 10350      | 221 | ●          |           |           |           |           |           |           |           |
| _ 10800      | 211 | ●          | ●         |           |           |           |           |           |           |
| _ 10801      | 213 | ●          | ●         |           |           |           |           |           |           |
| _ 10820      | 215 | ●          | ●         |           |           |           |           |           |           |
| _ 10821      | 217 | ●          | ●         |           |           |           |           |           |           |
| _ 11260      | 379 |            |           |           |           |           | ●         |           |           |
| _ 11261      | 379 |            |           |           |           |           | ●         |           |           |
| _ 11270      | 381 |            |           | ●         |           |           |           |           |           |
| _ 11271      | 381 |            |           | ●         |           |           |           |           |           |
| _ 11425      | 275 |            |           | ●         |           |           |           |           |           |
| _ 11480      | 299 | ●          | ●         |           |           |           |           |           |           |
| _ 11482      | 301 | ●          | ●         |           |           |           |           |           |           |
| _ 11820      | 341 | ●          |           |           |           |           |           |           |           |
| _ 11846      | 343 | ●          |           |           |           |           |           |           |           |
| _ 11950      | 385 |            |           | ●         |           |           |           |           |           |
| _ 11951      | 385 |            |           | ●         |           |           |           |           |           |
| _ 11960      | 383 |            |           |           |           |           | ●         |           |           |
| _ 11961      | 383 |            |           |           |           |           | ●         |           |           |
| _ 11970      | 347 | ●          |           |           |           |           |           |           |           |
| _ 11971      | 347 | ●          |           |           |           |           |           |           |           |
| _ 11980      | 349 | ●          |           |           |           |           |           |           |           |
| _ 11981      | 349 | ●          |           |           |           |           |           |           |           |
| _ 22200      | 391 | ●          |           | ●         |           |           |           |           |           |
| _ 22300      | 393 | ●          |           | ●         |           |           |           |           |           |
| _ 24200      | 395 |            |           | ●         |           |           |           |           |           |
| _ 24220      | 399 |            |           | ●         |           |           |           |           |           |
| _ 24300      | 397 |            |           | ●         |           |           |           |           |           |
| _ 24320      | 401 |            |           | ●         |           |           |           |           |           |
| _ 24340      | 403 |            |           | ●         |           |           |           |           |           |
| _ 24360      | 405 |            |           | ●         |           |           |           |           |           |
| _ 24370      | 407 |            |           | ●         |           |           |           |           |           |
| _ 26020      | 417 |            |           | ●         |           |           |           |           |           |
| _ 26040      | 419 |            |           | ●         |           |           |           |           |           |
| _ 28500      | 421 | ●          |           |           |           |           |           |           | ●         |





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