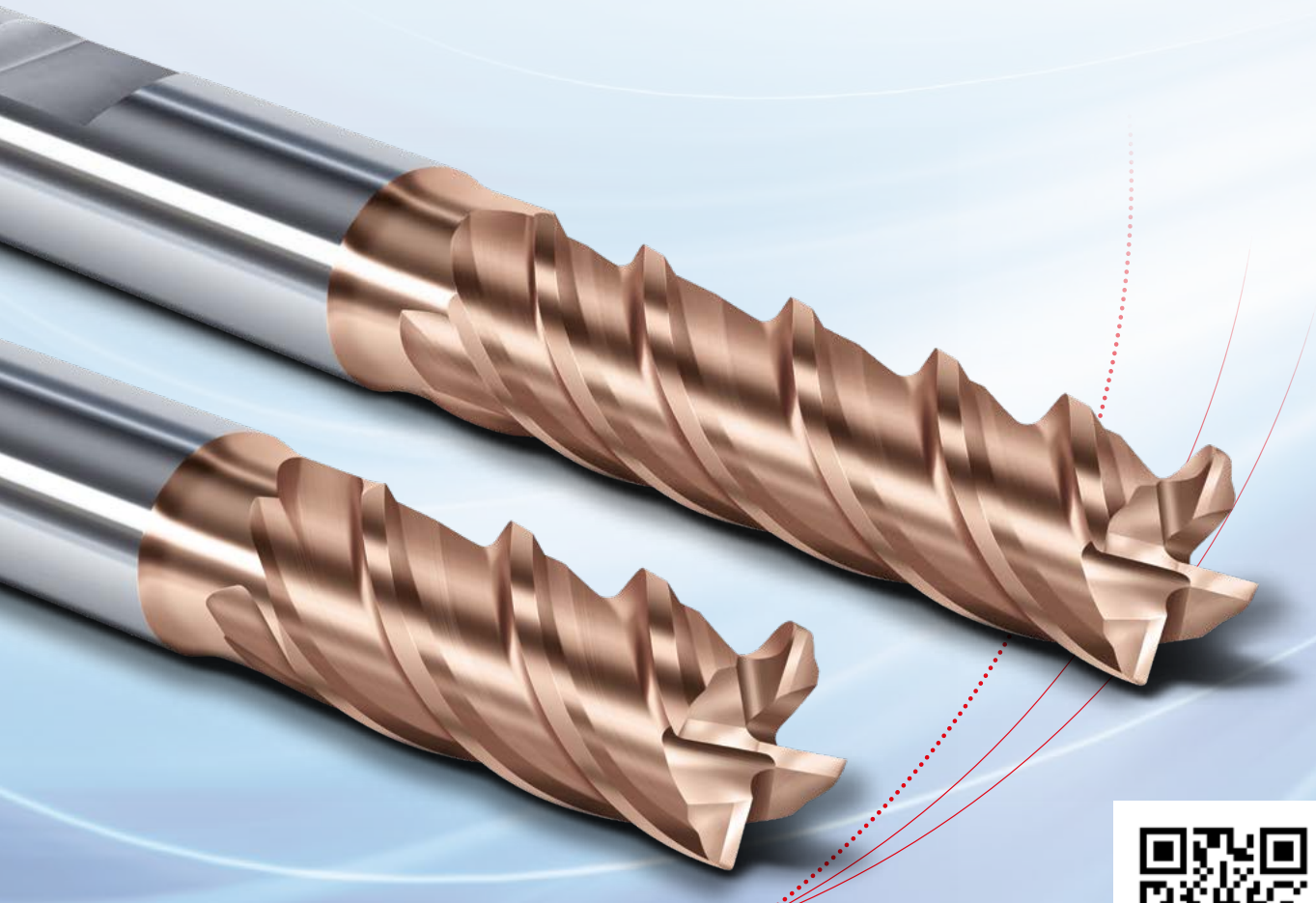
passion
for precision

fraisa

SX High-performance Milling Cutter

The specialist for machining stainless steels

NEW



Cutting data calculator

FRAISA
ToolExpert® 2.0

SX technology: Maximum performance and process reliability

The new **SX high-performance milling cutter** from FRAISA has been developed specifically for machining stainless and acid-resistant steels. A **high degree of universality, excellent cutting performance** and a **long tool life** are its trademarks.

During countless cutting trials, the cutting-edge geometry has been optimized in such a way that **maximum stability** and **very low-friction chip discharge** have been achieved at the same time. The result is silky smooth running of the cutter with low cutting forces.
Very tough but also abrasive rustproof and acid-resistant materials pose a challenging complex of loads for tools. Ultrafine-grain carbides have a high hardness and considerable edge strength.

Ultrafine-grain carbides form the basis of **SX high-performance milling cutters.** To protect the carbide from high temperatures and abrasive wear, an extremely smooth **DURO-Si hard coating** was chosen. As a result, the hardware of the cutters is made up of perfectly coordinated components.

In addition to FRAISA's innovative tool and production technology, another point is fundamental to the success of **SX** tools: The expertise of the cutting data matched to the **materials of the "INOX"** group.
This knowledge is integrated in the **new ToolExpert 2.0** cutting data calculator and guarantees **simple, reliable, and fast implementation** in production. This makes **milling difficult stainless and heat-resistant steels** easy.

The wide **range of applications SX high-performance milling cutters** are capable of is another big benefit of this new technology. In addition to the main purpose for which they were designed, namely, **HPC processes**, these cutters are also ideal for **HDC machining**. After use, the tools can be restored to their original condition by the **FRAISA ReTool®** reconditioning service and later recycled by means of **ReToolBlue** service at the end of the service life.

The advantages

Excellent cost-performance ratio:

- High performance, long tool life, repeat accuracy and reliability
- ToolCare® tool management, FRAISA ReTool® tool reconditioning and ReToolBlue tool recycling
- Application know-how for stainless, acid- and temperature-resistant steels

Comprehensive range with catalog cutting data

- Diameters between 3 mm and 20 mm
- Two different lengths: standard and medium-long
- Specially developed catalog cutting data for HPC machining
- Tools with a corner radius available on request (custom-made)

Wide range of applications

- For replacing existing tools and as a solution for new applications
- HPC machining with 65% ae and 1.5xd ap, ToolExpert 2.0 with HDC machining
- Maximum performance thanks to the perfect combination of tool type and cutting data
- Soft-cutting tools for dependable use in demanding applications

Perfection – FRAISA ToolExpert® 2.0

- Completely revised cutting performance data and revised material table
- Quick, simple, and reliable cutting-data search function by entering the material number
- Automatic data transfer to CAM

FRAISA ToolExpert® 2.0 – The innovative online tool for optimum tool use

Perfectly coordinated tool- and material-specific cutting data for your production line: ToolExpert 2.0 provides the perfect basis for optimum usage of your FRAISA tools – quick and easy.

FRAISA experts determine the optimum operating points in comprehensive tests carried out at our own application centers. All factors involved are taken into account, so that the new ToolExpert 2.0 offers you a comprehensive collection of data all in one place.

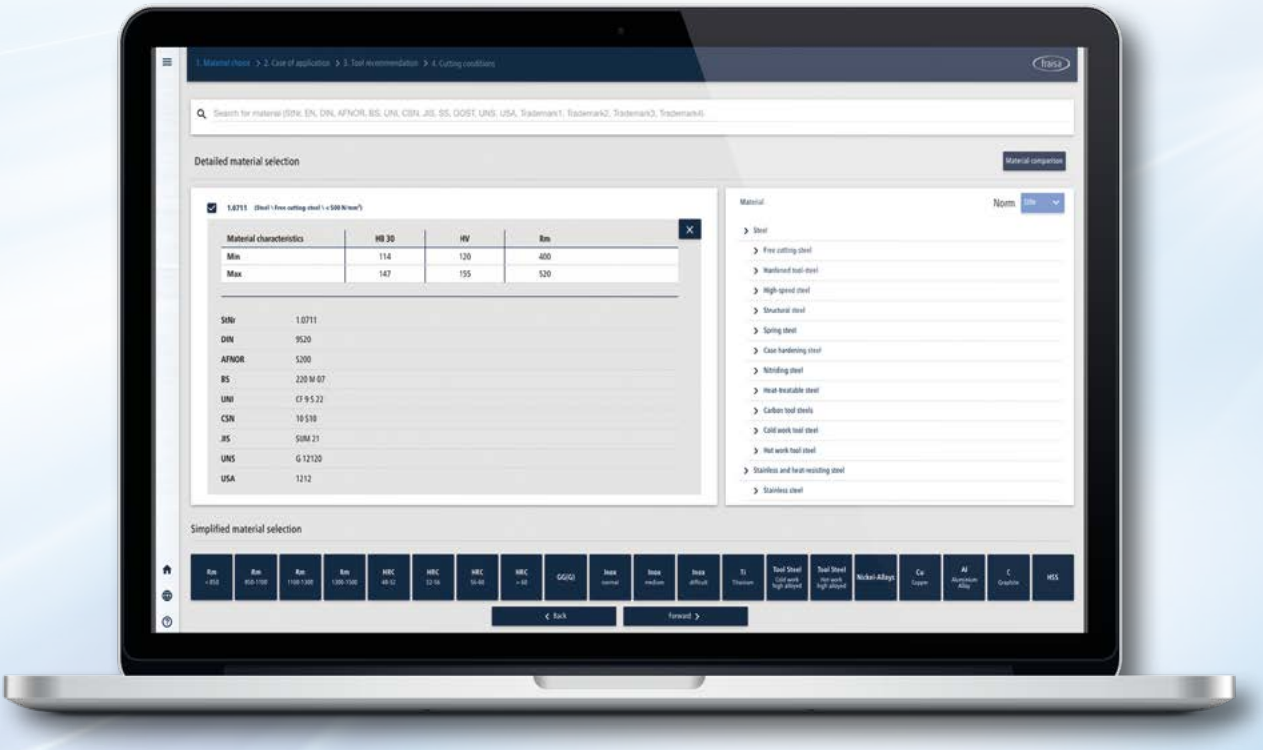
FRAISA ToolExpert® 2.0 offers many advantages

- **Precise:** Find perfectly coordinated, tool- and material-specific cutting data
- **Simple:** Access data online at any time and from anywhere without software downloads
- **Quick:** Find application parameters with just a few clicks and without registering
- **Order function:** Order the tool you want directly from our E-shop via a link
- **Flexible:** Search for tools or materials to be machined as required
- **Comprehensive:** Call up cutting data for FRAISA tools from a database of more than 11,000 materials
- **User-friendly:** Work intuitively thanks to the new, responsive design

Entering the exact material designation

The current ToolExpert 2.0 contains **11,200 materials and comparisons of standards** grouped into **30 machining classes**. Even within the assigned machining classes, materials have different properties that affect machinability. Each material is therefore individually fine-tuned with respect to its machinability with the aid of specific additions, as a result of which the cutting data are reduced or increased accordingly.

If you use the simplified material selection method (softkey), the cutting data is retrieved from the machining class level. By **entering the exact material designation in ToolExpert 2.0**, you obtain the best cutting data possible for your application.



The technologies of the SX high-performance tools

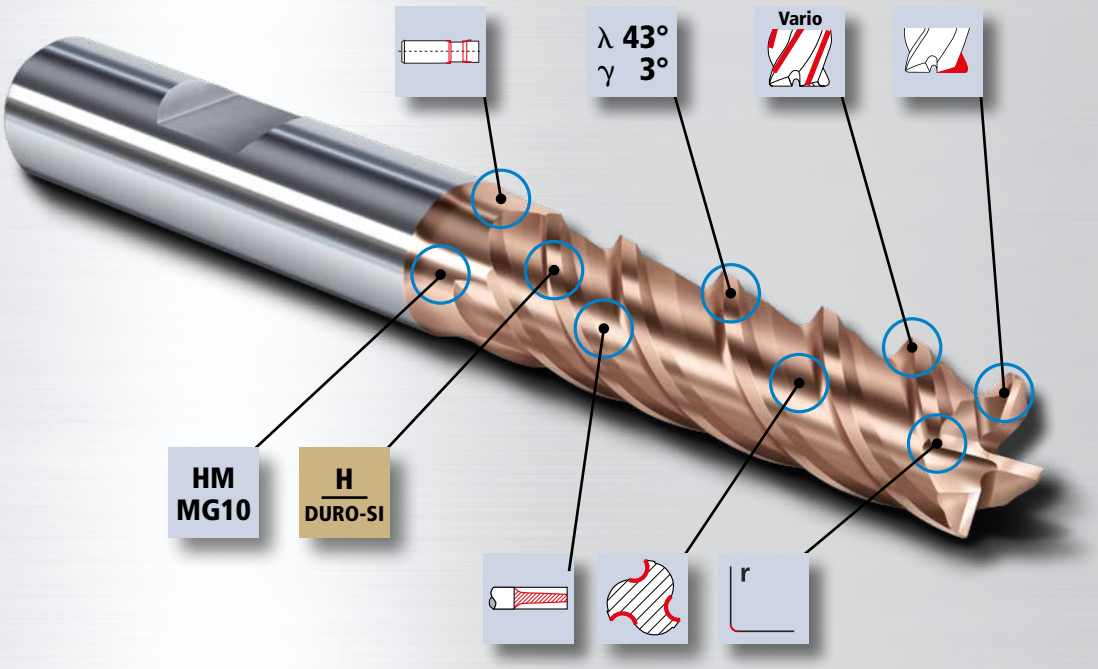
The new **SX technology** was developed in FRAISA's Production department and Test Center, while the FRAISA ToolSchool was responsible for developing and validating the cutting data. All product development measures were focused on achieving **high productivity, a long tool life and cost efficiency**.

A **strong-edged, ultrafine-grain carbide** with **excellent wear properties** forms the basis of the SX high-performance tools. A positive, easy-cut geometry was combined with **optimized flutes** and an **increasing tool core diameter**. The result: **Optimum chip formation, good chip removal,** and **high tool stability.**

To ensure the **SX** tools can withstand high mechanical and thermal stresses, the exposed cutting-edge corner has been equipped with a **special, robust, polished tooth edge** and a **small corner radius**.

The **high-performance DURO-Si coating** protects the tools against high temperature loads and ensures **maximum performance and tool life** by means of its high wear resistance. The **SX high-performance tools** are ideally suited to HPC and HDC machining and consequently cover a **wide range of applications and materials**.

The technologies



Detailed descriptions of each technology can be found in our "High-performance Milling Tools" catalog.

FRAISA tool technology for maximum competitiveness!

FRAISA carries out extensive tests with **its own high-performance milling cutters** and **milling tools made by competitors**. We do this to keep a constant eye on the status quo in tool and application technology. These tests involve using the milling cutters in **different materials with different milling strategies**.

A special focus is placed on HDC milling: Due to the high mechanical and thermal loads, testing with this milling process is particularly intensive. This ensures that the tools can be used for a **wide range of materials and applications** – while also providing **maximum performance** and a **long service life.**

Application expertise for optimum results

Machining stainless, acid- and heat-resistant steels is a **particular challenge**. Using the right high-performance tool and the appropriate cutting data for the job is crucial. But it's also essential to monitor other factors and make optimizations if necessary.

Notes on application technology:

Cooling lubricant:

The external cooling lubricant jet should be **aimed precisely**. Use the internal coolant supply and feed with suitable clamping devices. The **type of cooling lubricant** and the concentration of the emulsion used also have a significant influence on performance. If conditions are not ideal or unstable, reduce the cutting data vc and/or ae.

Material:

Material batches can differ despite having the same material number. For this reason, you should monitor the milling results closely after **a batch change** and play things safe by reducing the cutting parameters.

Programming:

"Smooth traverses" without abrupt changes of direction and excessively high cutting edge utilization should be programmed. Reduce the cutting data in less than ideal or unstable conditions.

Tool:

Too large a tool diameter can overload the machine environment and the application. As a result, it is better to use smaller tool diameters with a high ap and ae.

Chucking devices:

The SX technology was mainly developed in chucking devices with a lateral chucking slot (Weldon shank). These are high-performance roughing tools for HPC and HDC machining – so any concentricity error caused by the chucking screw is irrelevant.

Our product experts recommend that you use good-quality, undamaged chucking devices and tighten the screw to the torque specified by the manufacturer.

Overview of materials, comparisons of standards, and chemical composition

Materials and comparisons of standards are grouped into 30 machining classes. Even within the assigned machining classes, materials have different mechanical, physical, and chemical properties that affect machinability. By entering the exact designation of a material in ToolExpert 2.0, you can call up the specific cutting data for this material.

Inox normal
Cr-Ni

1.4301	1.4303	1.4305	1.4306
X5CrNi18-9 Z6CN18.09 AISI 304	X5CrNi18-12 Z8CN18.12 AISI 308, 305	X10CrNiS18-9 Z10CNF18.09 AISI 303	X2CrNi19-11 Z2CN18.10 AISI 304L
Cr Ni Mo 18 9	Cr Ni Mo 18 12	Cr Ni Mo 18 9	Cr Ni Mo 19 11
1.4307	**1.4310**	**1.4401**	**1.4404**
X2CrNi18-9 Z2CN18.10 AISI 304L	X12CrNi17-7 Z12CN17.07 AISI 301	XCrNiMo18-10 Z6CND17.11 AISI 316	X2CrNiMo17-13-2 Z2CND17.12 AISI 316L
Cr Ni Mo 18 9	Cr Ni Mo 17 7	Cr Ni Mo 18 10	Cr Ni Mo 17 13 2
1.4541	**1.4567**	**1.4571**	
X6CrNiTi18-10 Z6CNT18.10 AISI 321	X3CrNiCu18-9-4 Z3CNU18-10 AISI 304 Cu	X6CrNiMoTi17-12-2 Z6CNT17.12 AISI 316 Ti	
Cr Ni Mo 18 10	Cr Ni Cu 18 9 4	Cr Ni Mo 17 12 2	

Inox medium
Cr-Ni-Mo+

1.4429	1.4435	1.4436	1.4462
X2CrNiMoN17-13-3 Z2CND17.13Az AISI 316LN	X2CrNiMo18-14-3 Z3CND18.14.08 AISI 316L	X5CrNiMo17-13-3 Z6CND18.12.03 AISI 316	X2CrNiMoN22-5-3 Z 2 CND 22 5 Az AISI 318 LN
Cr Ni Cu 17 13 3	Cr Ni Mo 18 14 3	Cr Ni Mo 17 13 3	Cr Ni Mo 22 5 3
1.4539	**1.4542 (17-4PH)**	**1.4545 (15-5PH)**	**1.4578**
X2NiCrMoCu25-20-5 Z1CNDU25.20 AISI 904L	X5CrNiCuNb17-14 Z5CNU17.4 AISI 630	X5CrNiCu15-5 Z5CNU15.05 AISI XM12	X3CrNiCuMo17-11-3-2 Z4CNUD17.11.03FF
Ni Cr Mo 25 20 5	Cr Ni 17 14	Cr Ni 14 5	Cr Ni Cu Mo 17 11 3 2
1.4821	**1.4828**	**1.4835**	**1.4878**
X15CrNiSi25-4 Z20CNS25.04	X15CrNiSi20-12 Z9CN24.13 AISI 309	X9CrNiSiNCe21-11-2 AISI 253MA	X8CrNiTi18-10 Z6CNT18.10 AISI 321H
Cr Ni Mo 18 12	Cr Ni 20 12	Cr Ni Si 21 11 2	Cr Ni 18 10

Inox difficult
Cr-Ni-Mo++

1.4529			1.4562			1.4841		1.4872		
X1NiCrMoCuN25-20-7 AISI 926			X1NiCrMoCu32-28-7			X15CrNiSi25-21 Z15CNS25.20 AISI 314		X25CrMnNiN25-9-7		
Ni	Cr	Mo	Ni	Cr	Mo	Cr	Ni	Cr	Mn	Ni
25	20	7	32	28	7	25	21	25	9	7

1.4876	
X10NiCrAlTi32-21 Z10NC32.21 AISI 800H	
Ni	Cr
32	21

Inox martensitic
C < 0.3 %

1.4005		1.4006		1.4021		1.4024	
X12CrS13 Z12CF13 AISI 416		X10Cr13 Z12C13 AISI 410		X20Cr13 Z20C13 AISI 420		X15Cr13 Z13C13 AISI 420	
C	Cr	C	Cr	C	Cr	C	Cr
0.12	13	0.1	13	0.2	13	0,15	13

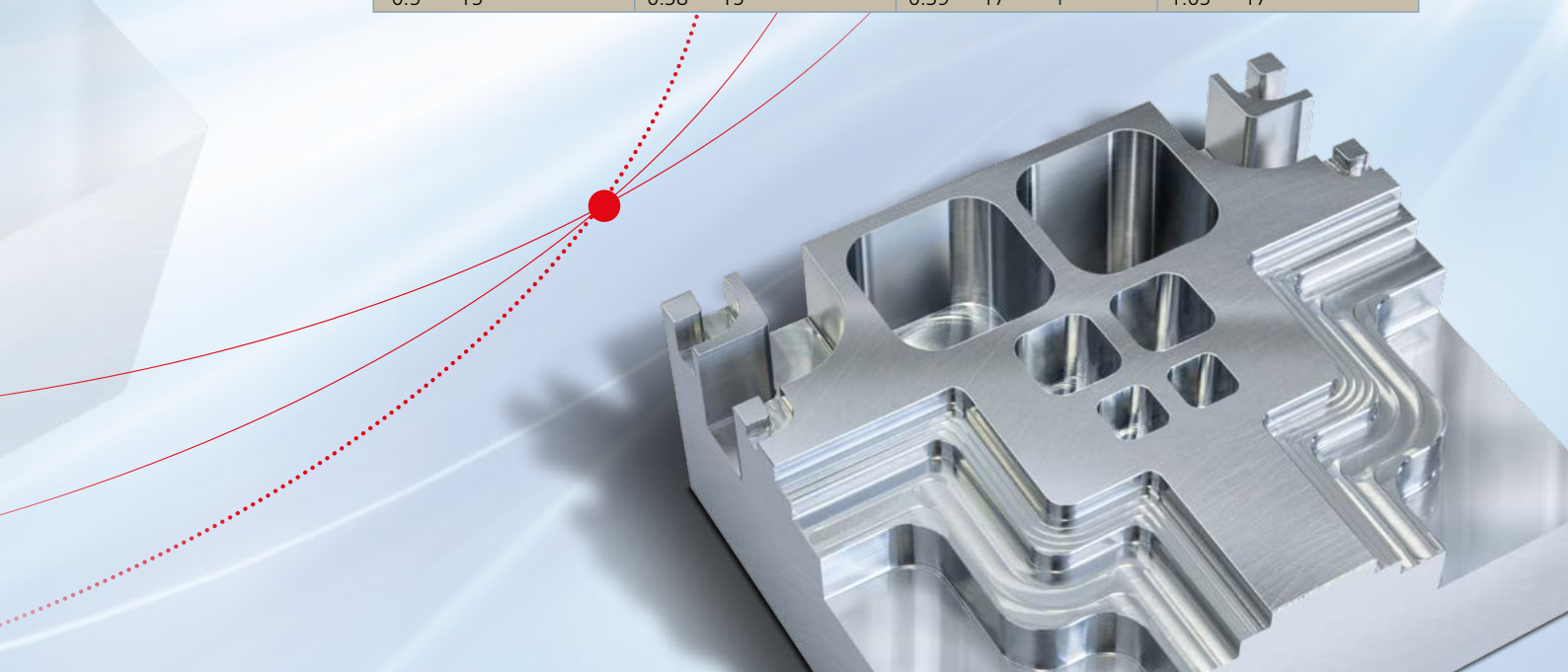
1.4028		1.4044			1.4057			1.4104	
X30Cr13 Z30C13 AISI 420		X15CrNi17-3 Z15CN16.02 AISI 431			X20CrNi16-2 Z15CN16.02 AISI 431			X12CrMoS17 Z10CF17 AISI 430F	
C	Cr	C	Cr	Ni	C	Cr	Ni	C	Cr
0.3	13	0.15	17	3	0.2	16	2	0.14	17

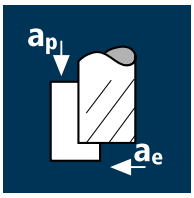
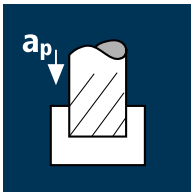
1.4108	
X30CrMoN15-1	
C	Cr
0.3	15

Inox martensitic
C > 0.3 %

1.4031		1.4034		1.4037		1.4112	
X39Cr13 Z40C14		X46Cr13 Z40C14		X65Cr13		X90CrMoV18 AISI 440B	
C	Cr	C	Cr	C	Cr	C	Cr
0.39	13	0.46	13	0.65	13	0.9	18

1.4116		1.4117		1.4122			1.4125	
X50CrMoV15 Z50CD15		X38CrMoV15		X39CrMo17-1			X105CrMo17 Z100CD17 AISI 440C	
C	Cr	C	Cr	C	Cr	Mo	C	Cr
0.5	15	0.38	15	0.39	17	1	1.05	17



Application	Material	d1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]	Q [cm^3/min]
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] H	3.00	4	96	0.015	3.750	1.200	10185	610	2.8
		4.00	4	96	0.020	5.000	1.600	7640	610	4.9
		5.00	4	80	0.023	6.250	3.250	5095	470	9.5
		6.00	4	80	0.027	9.000	3.900	4245	460	16.1
		8.00	4	80	0.036	12.000	5.200	3185	460	28.6
		10.00	4	80	0.045	15.000	6.500	2545	460	44.7
		12.00	4	80	0.054	18.000	7.800	2120	460	64.4
		16.00	4	80	0.064	20.000	10.400	1590	405	84.7
		20.00	4	80	0.080	25.000	13.000	1275	405	132.4
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH] H	3.00	4	59	0.014	3.750	1.200	6260	340	1.5
		4.00	4	59	0.020	5.000	1.600	4695	375	3.0
		5.00	4	59	0.023	6.250	3.250	3755	340	6.9
		6.00	4	59	0.027	9.000	3.900	3130	340	11.9
		8.00	4	59	0.036	12.000	5.200	2350	340	21.1
		10.00	4	59	0.045	15.000	6.500	1880	340	33.0
		12.00	4	59	0.054	18.000	7.800	1565	340	47.5
		16.00	4	59	0.064	20.000	10.400	1175	300	62.5
		20.00	4	59	0.080	25.000	13.000	940	300	97.7
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841] H	3.00	4	48	0.014	3.750	1.200	5095	275	1.2
		4.00	4	48	0.018	5.000	1.600	3820	275	2.2
		5.00	4	44	0.020	6.250	3.250	2800	225	4.6
		6.00	4	44	0.024	9.000	3.900	2335	225	7.9
		8.00	4	44	0.032	12.000	5.200	1750	225	14.0
		10.00	4	44	0.040	15.000	6.500	1400	225	21.8
		12.00	4	44	0.048	18.000	7.800	1165	225	31.5
		16.00	4	44	0.056	20.000	10.400	875	195	40.8
		20.00	4	44	0.070	25.000	13.000	700	195	63.7
	Inox martensitic C < 0.3% [Cr/1.4021] H	3.00	4	122	0.020	3.750	1.200	12945	1010	4.5
		4.00	4	122	0.026	5.000	1.600	9710	1010	8.1
		5.00	4	102	0.030	6.250	3.250	6495	780	15.8
		6.00	4	102	0.036	9.000	3.900	5410	780	27.4
		8.00	4	102	0.048	12.000	5.200	4060	780	48.6
		10.00	4	102	0.060	15.000	6.500	3245	780	76.0
		12.00	4	102	0.072	18.000	7.800	2705	780	109.4
		16.00	4	102	0.088	20.000	10.400	2030	715	148.6
		20.00	4	102	0.110	25.000	13.000	1625	715	232.1
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] H	3.00	4	70	0.009	2.250	3.000	7425	265	1.8
		4.00	4	70	0.012	3.000	4.000	5570	265	3.2
		5.00	4	70	0.015	6.250	5.000	4455	265	8.3
		6.00	4	70	0.022	9.000	6.000	3715	320	17.3
		8.00	4	70	0.029	12.000	8.000	2785	320	30.8
		10.00	4	70	0.036	15.000	10.000	2230	320	48.1
		12.00	4	70	0.043	18.000	12.000	1855	320	69.3
		16.00	4	70	0.051	20.000	16.000	1395	285	91.3
		20.00	4	70	0.064	25.000	20.000	1115	285	142.6
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH] H	3.00	4	47	0.008	2.250	3.000	4985	160	1.1
		4.00	4	47	0.012	3.000	4.000	3740	180	2.2
		5.00	4	52	0.015	6.250	5.000	3310	195	6.1
		6.00	4	52	0.022	9.000	6.000	2760	240	12.9
		8.00	4	52	0.029	12.000	8.000	2070	240	22.9
		10.00	4	52	0.036	15.000	10.000	1655	240	35.8
		12.00	4	52	0.043	18.000	12.000	1380	240	51.5
		16.00	4	52	0.051	20.000	16.000	1035	210	67.8
		20.00	4	52	0.064	25.000	20.000	830	210	105.9
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841] H	3.00	4	39	0.008	2.250	3.000	4140	135	0.9
		4.00	4	39	0.011	3.000	4.000	3105	135	1.6
		5.00	4	39	0.013	6.250	5.000	2485	130	4.0
		6.00	4	39	0.019	9.000	6.000	2070	160	8.6
		8.00	4	39	0.026	12.000	8.000	1550	160	15.3
		10.00	4	39	0.032	15.000	10.000	1240	160	23.8
		12.00	4	39	0.038	18.000	12.000	1035	160	34.3
		16.00	4	39	0.045	20.000	16.000	775	140	44.5
		20.00	4	39	0.056	25.000	20.000	620	140	69.5
	Inox martensitic C < 0.3% [Cr/1.4021] H	3.00	4	89	0.009	2.250	3.000	9445	340	2.3
		4.00	4	89	0.012	3.000	4.000	7080	340	4.1
		5.00	4	89	0.015	5.000	5.000	5665	340	8.5
		6.00	4	89	0.022	7.500	6.000	4720	410	18.4
		8.00	4	89	0.029	10.000	8.000	3540	410	32.6
		10.00	4	89	0.036	12.500	10.000	2835	410	51.0
		12.00	4	89	0.043	15.000	12.000	2360	410	73.4
		16.00	4	89	0.053	16.000	16.000	1770	375	95.7
		20.00	4	89	0.066	20.000	20.000	1415	375	149.6

Cylindrical end mills SX

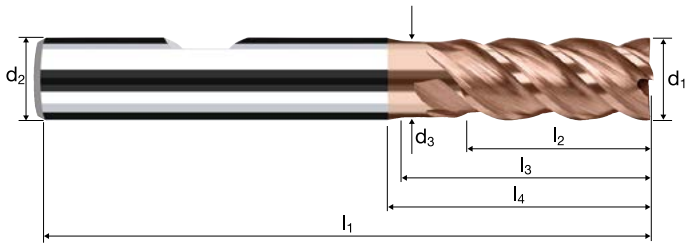
Smooth-edged, normal version with short neck

X-Generation X

HM MG10 | λ 43° γ 3°

r

Vario

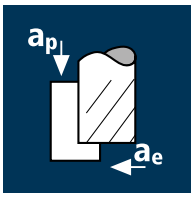
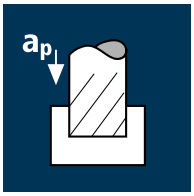


new!

Roughing HPC | Roughing HDC | Finishing

Rm < 850							Inox Stainless	Ti Titanium	Nickel-Alloys Mangan-Steels Tool Steel

Example: **Order-N°.**	Coating	Article-N°.	ø-Code									DURO-Si
	H	8606	180									H8606
												H8506
Ø Code		d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	α	z	
180		3.00	6.00	2.80	57	8.00	14.00	20.37	0.050	4.5°	4	●
220		4.00	6.00	3.70	57	11.00	16.00	20.82	0.100	3.0°	4	●
260		5.00	6.00	4.60	57	13.00	18.00	21.27	0.100	1.5°	4	●
300		6.00	6.00	5.50	57	13.00	18.15	20.00	0.150	0.0°	4	●
391		8.00	8.00	7.40	63	19.00	23.63	26.00	0.150	0.0°	4	●
450		10.00	10.00	9.20	72	22.00	27.99	31.00	0.200	0.0°	4	●
501		12.00	12.00	11.00	83	26.00	33.29	37.00	0.200	0.0°	4	●
610		16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	0.0°	4	●
682		20.00	20.00	19.00	104	38.00	48.23	53.00	0.250	0.0°	4	●

Application	Material	d1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min^{-1}]	v_f [mm/min]	Q [cm^3/min]
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] H	3.00	4	86	0.013	3.750	1.200	9125	475	2.1
		4.00	4	86	0.017	5.000	1.600	6845	465	3.7
		5.00	4	72	0.020	6.250	3.250	4585	370	7.5
		6.00	4	72	0.024	9.000	3.900	3820	370	13.0
		8.00	4	72	0.032	12.000	5.200	2865	370	23.2
		10.00	4	72	0.041	15.000	6.500	2290	370	36.2
		12.00	4	72	0.049	18.000	7.800	1910	370	52.1
		16.00	4	72	0.058	20.000	10.400	1430	330	68.6
		20.00	4	72	0.072	25.000	13.000	1145	330	107.3
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH] H	3.00	4	53	0.013	3.750	1.200	5625	290	1.3
		4.00	4	53	0.017	5.000	1.600	4220	285	2.3
		5.00	4	53	0.020	6.250	3.250	3375	275	5.6
		6.00	4	53	0.024	9.000	3.900	2810	275	9.6
		8.00	4	53	0.032	12.000	5.200	2110	275	17.1
		10.00	4	53	0.041	15.000	6.500	1685	275	26.6
		12.00	4	53	0.049	18.000	7.800	1405	275	38.4
		16.00	4	53	0.058	20.000	10.400	1055	245	50.5
		20.00	4	53	0.072	25.000	13.000	845	245	79.0
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841] H	3.00	4	44	0.012	3.750	1.200	4670	215	1.0
		4.00	4	44	0.015	5.000	1.600	3500	210	1.7
		5.00	4	40	0.018	6.250	3.250	2545	185	3.7
		6.00	4	40	0.022	9.000	3.900	2120	180	6.4
		8.00	4	40	0.029	12.000	5.200	1590	185	11.5
		10.00	4	40	0.036	15.000	6.500	1275	185	17.9
		12.00	4	40	0.043	18.000	7.800	1060	180	25.6
		16.00	4	40	0.050	20.000	10.400	795	160	33.1
		20.00	4	40	0.061	25.000	13.000	635	155	50.5
	Inox martensitic C < 0.3% [Cr/1.4021] H	3.00	4	110	0.017	3.750	1.200	11670	780	3.5
		4.00	4	110	0.023	5.000	1.600	8755	790	6.3
		5.00	4	92	0.027	6.250	3.250	5855	635	12.8
		6.00	4	92	0.032	9.000	3.900	4880	635	22.3
		8.00	4	92	0.043	12.000	5.200	3660	630	39.3
		10.00	4	92	0.054	15.000	6.500	2930	635	61.7
		12.00	4	92	0.065	18.000	7.800	2440	635	89.1
		16.00	4	92	0.079	20.000	10.400	1830	580	120.3
		20.00	4	92	0.097	25.000	13.000	1465	570	184.6
	Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571] H	3.00	4	63	0.007	2.250	3.000	6685	175	1.2
		4.00	4	63	0.009	3.000	4.000	5015	170	2.0
		5.00	4	63	0.013	6.250	5.000	4010	210	6.6
		6.00	4	63	0.019	9.000	6.000	3340	260	14.0
		8.00	4	63	0.026	12.000	8.000	2505	260	24.9
		10.00	4	63	0.032	15.000	10.000	2005	260	39.0
		12.00	4	63	0.039	18.000	12.000	1670	260	56.1
		16.00	4	63	0.046	20.000	16.000	1255	230	73.9
		20.00	4	63	0.058	25.000	20.000	1005	230	115.5
	Inox medium [Cr-Ni-Mo+/1.4539] Duplex steel [17-4 PH] H	3.00	4	42	0.007	2.250	3.000	4455	115	0.8
		4.00	4	42	0.009	3.000	4.000	3340	115	1.4
		5.00	4	46	0.013	6.250	5.000	2930	155	4.8
		6.00	4	46	0.019	9.000	6.000	2440	190	10.2
		8.00	4	46	0.026	12.000	8.000	1830	190	18.2
		10.00	4	46	0.032	15.000	10.000	1465	190	28.5
		12.00	4	46	0.039	18.000	12.000	1220	190	41.0
		16.00	4	46	0.046	20.000	16.000	915	170	54.0
		20.00	4	46	0.058	25.000	20.000	730	170	84.3
	Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841] H	3.00	4	35	0.006	2.250	3.000	3715	85	0.6
		4.00	4	35	0.007	3.000	4.000	2785	85	1.0
		5.00	4	35	0.012	6.250	5.000	2230	105	3.3
		6.00	4	35	0.017	9.000	6.000	1855	130	6.9
		8.00	4	35	0.023	12.000	8.000	1395	130	12.4
		10.00	4	35	0.029	15.000	10.000	1115	130	19.3
		12.00	4	35	0.034	18.000	12.000	930	130	27.6
		16.00	4	35	0.040	20.000	16.000	695	110	35.7
		20.00	4	35	0.049	25.000	20.000	555	110	54.4
	Inox martensitic C < 0.3% [Cr/1.4021] H	3.00	4	81	0.007	2.250	3.000	8595	230	1.6
		4.00	4	81	0.009	3.000	4.000	6445	230	2.8
		5.00	4	81	0.014	5.000	5.000	5155	280	7.0
		6.00	4	81	0.020	7.500	6.000	4295	335	15.1
		8.00	4	81	0.026	10.000	8.000	3225	335	26.6
		10.00	4	81	0.032	12.500	10.000	2580	335	41.8
		12.00	4	81	0.039	15.000	12.000	2150	335	60.3
		16.00	4	81	0.047	16.000	16.000	1610	305	78.2
		20.00	4	81	0.058	20.000	20.000	1290	300	120.0

Cylindrical end mills SX

Smooth-edged, medium length version with short neck

X-Generation

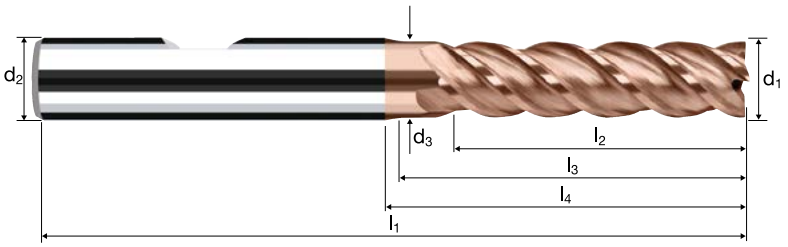
HM
MG10

λ 43°
γ 3°

r

Vario

new!



Roughing HPC | Roughing HDC | Finishing

Rm < 850							Inox Stainless	Ti Titanium	Nickel-Alloys Mangan-Steels Tool Steel

Example: **Order-N°.** Coating **H** | Article-N°. **8616** | ø-Code **180**

Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	α	z	DURO-Si H8616	DURO-Si H8516
180	3.00	6.00	2.80	63	11.00	18.00	24.37	0.050	4.5°	4		●
220	4.00	6.00	3.70	63	13.00	22.00	26.82	0.100	3.5°	4		●
260	5.00	6.00	4.60	63	16.00	24.00	27.27	0.100	1.5°	4		●
300	6.00	6.00	5.50	63	21.00	25.34	26.00	0.150	0.0°	4		●
391	8.00	8.00	7.40	72	31.00	34.79	35.50	0.150	0.0°	4		●
450	10.00	10.00	9.20	84	37.00	42.20	43.00	0.200	0.0°	4		●
501	12.00	12.00	11.00	97	44.00	50.13	51.00	0.200	0.0°	4		●
610	16.00	16.00	15.00	108	53.00	58.13	59.00	0.200	0.0°	4		●
682	20.00	20.00	19.00	122	62.00	70.13	71.00	0.250	0.0°	4		●

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