passion
for precision

fraisa

HX-RNVS and XSpeed-H –
universal and durable for high-hard steels

NEW

The HDC milling strategy takes hold in 2.5D and 3D machining of high-hard steels

Innovation made by FRAISA: high dynamic cutting in mold making

HDC machining has already proven its worth in multiple applications with nonhardened materials. And yet HDC machining is almost unknown in the field of mold making. With this in mind, FRAISA has developed two new types of tools that break into precisely this area and realize their enormous potential there. The **HX-RNVS** and **XSpeed-H** are perfect additions to the **HX family**, which has been specifically designed for high-performance milling of high-hard steels. Optimal tool geometries developed specifically for machining hardened steels, combined with an extremely hard Duro-Si coating, guarantee not only a long service life, but also universal operating conditions with 100% HDC suitability.

HX-RNVS tools are designed to be very robust and they are optimized for high cutting rates. The four-edged tool is ideal for materials with a hardness of more than 50 HRC and develops its maximum performance in 2.5D and 3D machining. In HDC applications, the contact length of the cutting edges with the material is long. The orbital motion in the case of the HDC strategy guarantees consistent chip thickness and cutting forces, for which the **HX-RNVS** is precisely designed. The result is exceptionally high machining rates and a long service life.

But the **HX-RNVS** also masters HPC applications with flying colors, highlighting the universal character of this tool.

The **HX-RNVS** is equipped with a highly precise corner radius. This makes the very strong and precise **HX-RNVS** virtually ideal for finishing operations with very narrow tolerance bands and premium surfaces.

Shifting the focus from universality to a long tool life, this is where the **XSpeed-H** comes into its own. The new **XSpeed-H** has been developed especially for HDC and HSC milling. The high number of cutting edges – with up to eight teeth – guarantees silky smooth movement of the milling tool.

As a result, wear and tear is spread across eight cutting edges and the tools can enjoy a very long service life. **XSpeed-H** milling tools enable feed rates to be doubled for both HSC and HDC milling. This is a very positive product feature that plays to the capabilities of today's highly dynamic milling machines and reduces production costs long-term.

The benefits:

- **Increased productivity** through use of the HDC milling strategy now also with 2.5D and 3D machining of hardened steels
- **Good cost efficiency** through faster milling processes with long tool life and fast feed and cutting rates
- **Maximum component accuracy** thanks to the tool's extreme concentricity, shank accuracy, and resulting precision
- **Lower tool costs** due to reduced wear thanks to Duro-Si hard coating and optimized wear distribution
- **Services available** FRAISA ToolCare® tool management system, **FRAISA ReTool® tool reconditioning, and** FRAISA ReToolBlue tool recycling

ToolExpert 2.0 – the innovative online tool for your production

In the age of Industry 4.0, it's all about working productively and precisely at all times. To achieve this, FRAISA develops not only high-quality and versatile tools, but also innovative software solutions, such as the new **ToolExpert 2.0.**

This user-friendly online tool delivers perfectly coordinated, tool- and material-specific cutting data for production purposes – and the perfect basis for optimum usage of FRAISA tools: quick and easy.

To this end, FRAISA experts determine the optimum operating points in comprehensive tests carried out at the company's own application centers. All factors involved are taken into account and the optimal data is then bundled in the new **ToolExpert 2.0** and continuously expanded.

When it comes to using the tools, this means you:

- ☑ find the optimum operating parameters quickly and reliably
- ☑ use perfectly coordinated tool- and material-specific cutting data
- ☑ download CAD data for selected tools

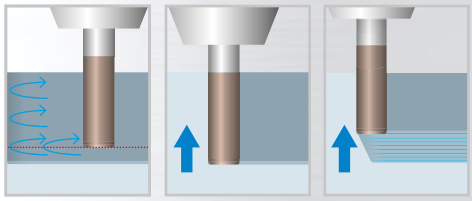
FRAISA ToolExpert offers many advantages:

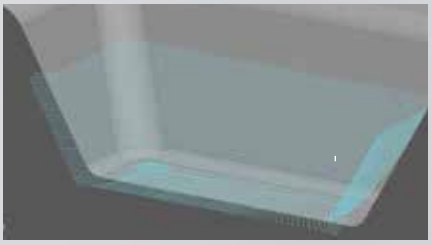
- **Precise:** Find perfectly coordinated, tool- and material-specific cutting data
- **Simple:** Access data online at any time and from anywhere without software downloads
- **Quick:** Find application parameters with a just few clicks and without registering
- **Order function:** Order the tool you 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 10,000 materials
- **User-friendly:** Work intuitively thanks to the new, responsive design

ToolExpert 2.0
cutting data calculator

All-round talents: Versatile

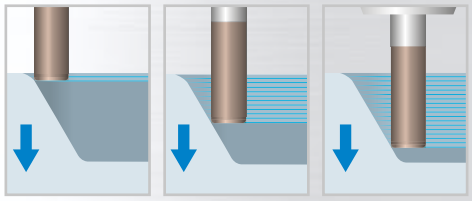
Application	Milling strategy	Tool path
High Dynamic Cutting – HDC	**Bottom-up strategy**	

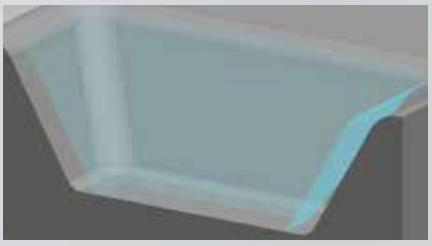




With the high-speed HDC roughing strategy, productivity can be increased even more significantly compared to HPC milling. Machining processes are speeded up, tools are gone easy on and the machine environment can be put to optimum use at lower costs.

High Speed Cutting – HSC	**Top-down strategy**	



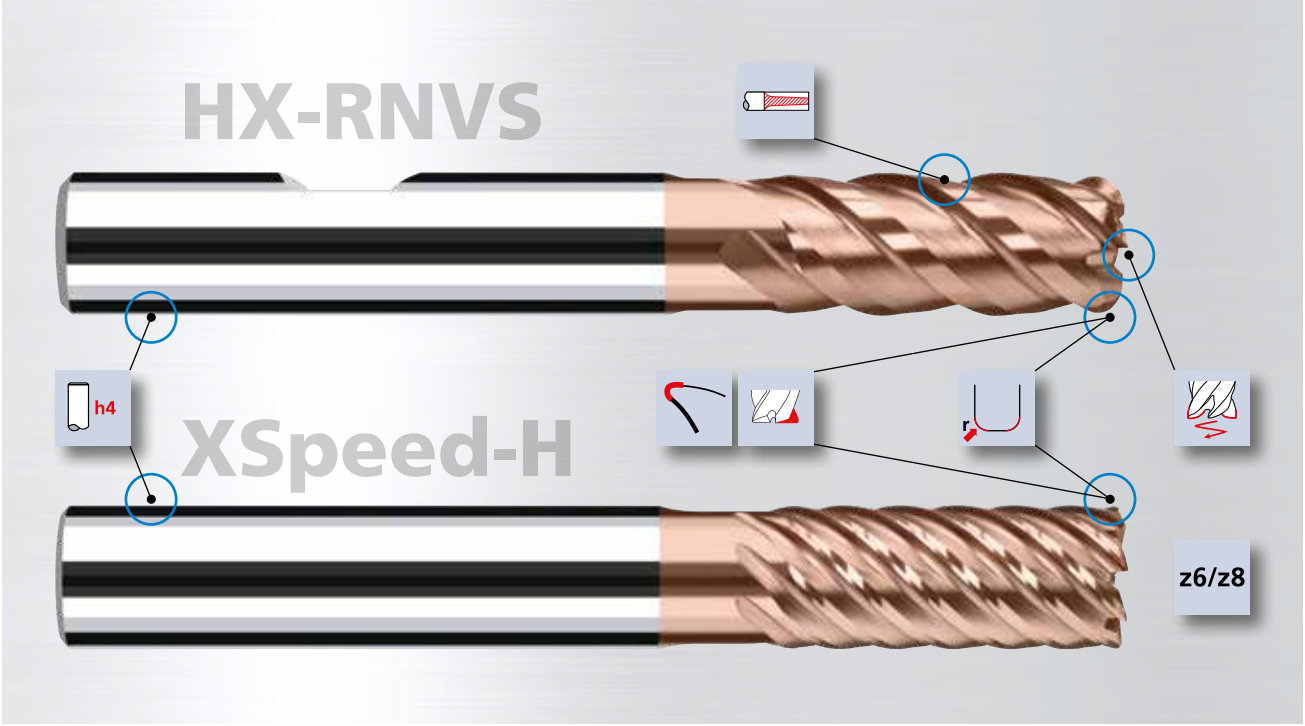


For HSC milling, tools with a large number of cutting edges are used. The cutting and feed rates are much higher than for normal machining. In particular, HSC is used for finishing in tool and mold making.

Our tools in action – get to know our all-round talents

The combination of highly innovative features results in a very powerful overall concept

The technologies



Milling tools with polished teeth
- Reinforcement of the exposed cutting edge
- Absorption of higher cutting forces

High-performance penetration edge
- Easy-cutting, high-performance penetration edge for high penetration angles of up to 5° in all hardened steels
- Better performance, longer tool life, and greater process reliability during penetration

Milling tools with increasing core diameter
- Improved tool rigidity and less deflection of the tool
- Superior performance for infeeds a_p, a_e, and the feed rate f_z
- Better component accuracy and less vibration
- Allows even heavy roughing steps

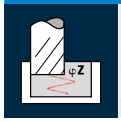
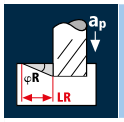
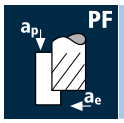
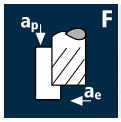
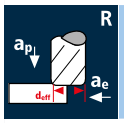
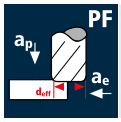
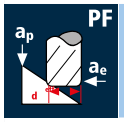
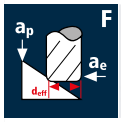
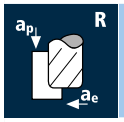
Milling tools with special edge conditioning
- Conditioning of the main cutting edge for greater cutting-edge stability
- Increased mechanical and thermal loading of the cutting edge
- Overall lengthening of tool life

High-precision radius tolerance of 0/+0.015 mm
- Specially configured position tolerances simplify programming and guaranteed completion of the final contour
- High-precision tolerance zone for excellent dimensional accuracy

Milling tools with H4 shank
- High concentricity and accuracy of eccentricity
- Higher clamping force in nonpositive chucks (hot shrinking, hydraulic expansion chuck)
- **Important:** Degrease the tool and chucking device before assembly in order to increase the holding force and prevent tool slippage!

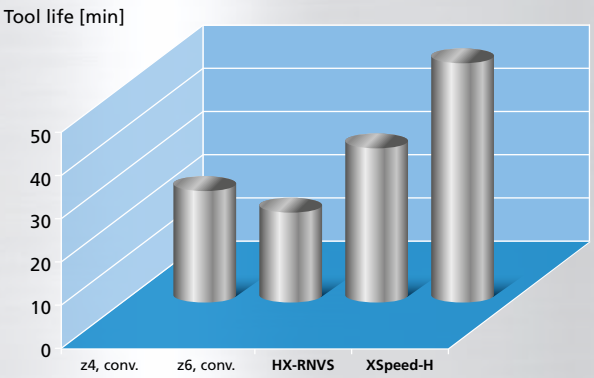
Large number of cutting edges
- Increased dynamics and feed rate
- Reduced tool wear

Impressive thanks to wide range of applications

Application		HX-RNVS	XSpeed-H
	Penetration w. helical interpolation	++	+
	Penetration with ramping	++	+
	Roughing in HDC-S	+	++
	Pre-finishing	+	++
	Finishing	+	++
	Plane roughing in HSC	++	++
	Plane finishing in HSC	+	++
	Pre-finishing steep sections in HSC	+	++
	Finishing steep sections in HSC	+	++
	Tracks in HPC	++	
	Flutes in HPC	++	

The two new milling cutters in the **HX family** – the **HX-RNVS** and the **XSpeed-H** – complement each other excellently in all fields of machining hardened steels, especially in mold making. In particular, high-hard steels can be machined efficiently.

Tool life with HDC milling in 1.2379



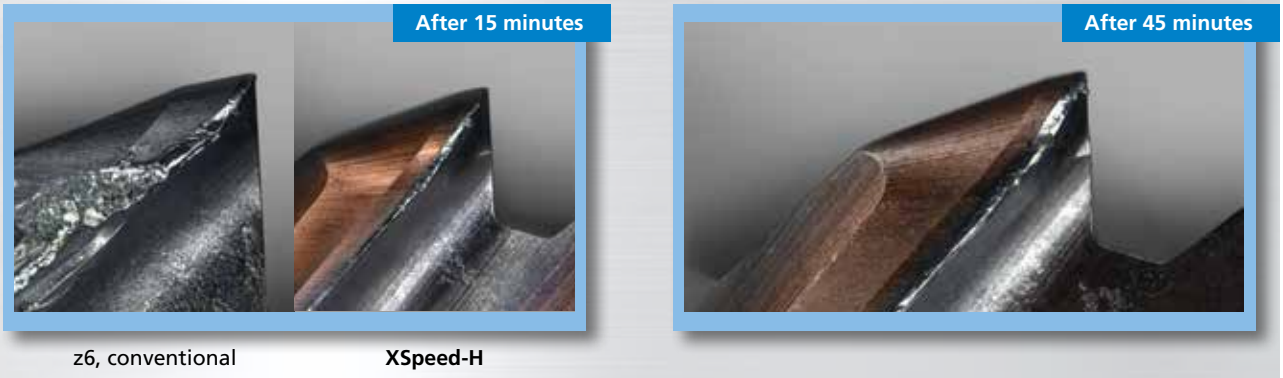
XSpeed-H: for HDC and HSC strategy
HX-RNVS: for HPC and HDC strategy

Long tool life

What's more, the cutting edges suffer from very little wear and retain extremely good cutting performance even after a long time in use.

This very high resistance to wear means the lifespan of the tools can be extended considerably.

XSpeed-H, z8:
Dia. 3–12, ER 0.2/0.5, standard length, ER tol. 0/+0.015



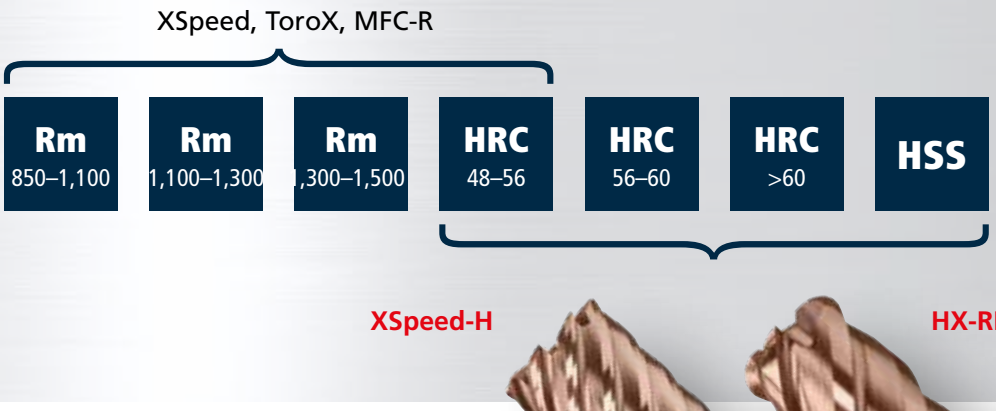
z6, conventional **XSpeed-H**

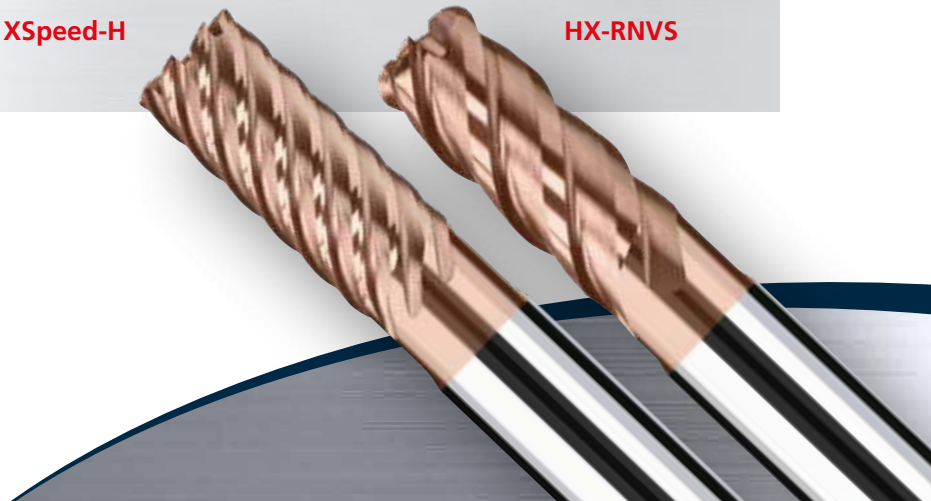
Material: 1.2379 (60 HRC), n = 3,330 rpm, vc = 105 m/min,
v_f = 2,900 mm/min, f_z = 0.108 (0.217 z4) mm/z, ER = 1, a = 9 mm, a_e = 0.3 mm (HDC milling)

Range of dimensions

	HX-RNVS	XSpeed-H
Version	Standard	Standard
z4	Dia. 3–16 25 GA	Dia. 2–12 16 GA
ER	0.2/0.5/1.0/1.5/2.0/2.5/3.0	0.2/0.5

Range of materials





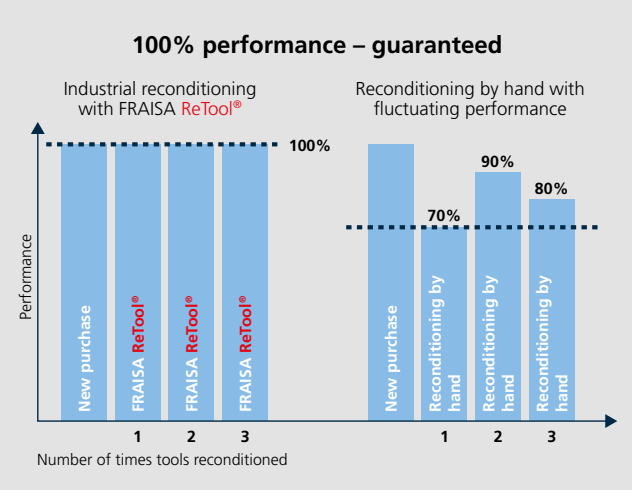
FRAISA ReTool® – Industrial tool reconditioning with performance guarantee

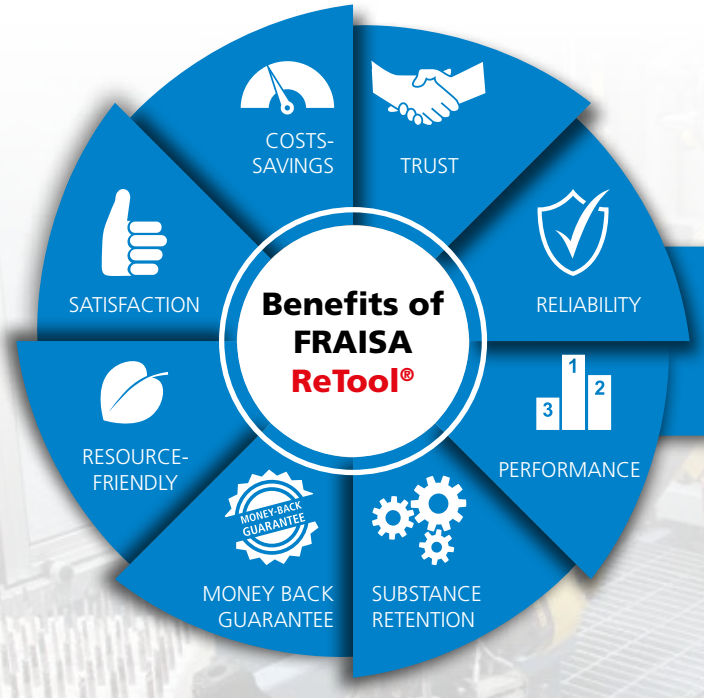
FRAISA ReTool® offers an all-round service that restores your used tools to their original performance level and optimizes your processes. FRAISA and third-party tools are reconditioned using the very latest technology – and in a resource-friendly way. The outcome: mint-condition tools as productive as they were the first day they were used. And to make things even better, your level of investment is lower than if you were to buy new tools, you increase your productivity and you save costs.

FRAISA ReTool® – a performance guarantee founded on integrated development of the tools and the reconditioning process

We guarantee that following their reconditioning with **FRAISA ReTool®**, your used tools will be restored to the original performance level they had when new. Our ability to provide this performance guarantee is a priority of our team of experts right from very early on in product development.

That's why the development of the reconditioning process is an integral part of the development phase, alongside the actual product tests and calculating the cutting data. Strict rules apply: the **FRAISA ReTool®** process is approved only if we are able to fulfil our performance guarantee 100%.





FRAISA ReToolBlue – recycle rather than throw away

With our FRAISA **ReToolBlue** service, we recycle the valuable carbide from tools that can no longer be reconditioned.

FRAISA ReTool® makes economic sense for you, too: After reconditioning them, we return your tools to you in mint condition. We restore them to their original performance level at a price that's more cost-effective for you than purchasing new ones or reconditioning them by hand.

Over 30 years' experience in tool reconditioning:

Our competence center in Germany is Europe's largest service center for carbide milling tools.

Video on our service product: FRAISA ReTool®

Corner radius end mills XSpeed-H

Tolerance r 0/+0.015, 3xd

HM
XA

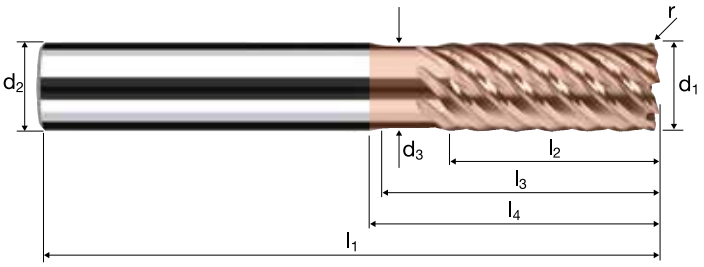
λ 45°
γ -10°

h4

d1

r

F



new!

HRC 48-56 | HRC 56-60 | HRC > 60 | HSS

Example: **Order-N°.** Coating **H** | Article-N°. **7210** | ø-Code **138**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	α	z	DURO-Si H7210
138	2.00	6.00	1.90	57	5.00	6.00	14.31	0.200	8.2°	6	●
178	3.00	6.00	2.80	57	8.00	9.00	15.63	0.200	5.7°	6	●
218	4.00	6.00	3.70	57	11.00	12.00	16.95	0.200	3.6°	6	●
258	5.00	6.00	4.60	57	13.00	15.00	18.27	0.200	1.8°	6	●
297	6.00	6.00	5.50	57	13.00	19.34	20.00	0.200	0.0°	8	●
385	8.00	8.00	7.40	63	19.00	25.29	26.00	0.200	0.0°	8	●
445	10.00	10.00	9.20	72	22.00	30.20	31.00	0.200	0.0°	8	●
496	12.00	12.00	11.00	83	26.00	36.13	37.00	0.200	0.0°	8	●
140	2.00	6.00	1.90	57	5.00	6.00	14.31	0.500	8.2°	6	●
180	3.00	6.00	2.80	57	8.00	9.00	15.63	0.500	5.7°	6	●
220	4.00	6.00	3.70	57	11.00	12.00	16.95	0.500	3.6°	6	●
260	5.00	6.00	4.60	57	13.00	15.00	18.27	0.500	1.8°	6	●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	0.500	0.0°	8	●
388	8.00	8.00	7.40	63	19.00	25.29	26.00	0.500	0.0°	8	●
448	10.00	10.00	9.20	72	22.00	30.20	31.00	0.500	0.0°	8	●
498	12.00	12.00	11.00	83	26.00	36.13	37.00	0.500	0.0°	8	●

Corner radius end mills HX-RNVS

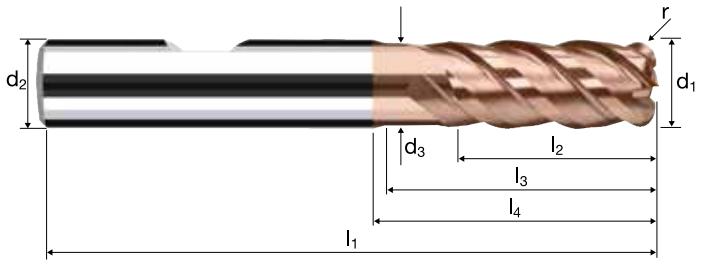
Smooth-edged, normal version with short neck
High-performance penetration edge

X-Generation

HM
XA

λ 45°
γ -10°

new!



Roughing HPC | Roughing HDC | Finishing

HRC 48-56 | HRC 56-60 | HRC > 60 | HSS

[10]

Example:
Order-N°. Coating **H** Article-N°. **8607** ø-Code **178**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	α	z	DURO-Si H8607	DURO-Si H8507
178	3.00	6.00	2.80	57	8.00	14.00	20.37	0.200	4.5°	4	●	
218	4.00	6.00	3.70	57	11.00	16.00	20.82	0.200	3.0°	4	●	
258	5.00	6.00	4.60	57	13.00	18.00	21.27	0.200	1.5°	4	●	
297	6.00	6.00	5.50	57	13.00	18.15	20.00	0.200	0.0°	4	●	
385	8.00	8.00	7.40	63	19.00	23.63	26.00	0.200	0.0°	4	●	
445	10.00	10.00	9.20	72	22.00	27.99	31.00	0.200	0.0°	4	●	
496	12.00	12.00	11.00	83	26.00	33.29	37.00	0.200	0.0°	4	●	
605	16.00	16.00	15.00	92	32.00	38.73	43.00	0.200	0.0°	4	●	
180	3.00	6.00	2.80	57	8.00	14.00	20.37	0.500	4.5°	4	●	
220	4.00	6.00	3.70	57	11.00	16.00	20.82	0.500	3.0°	4	●	
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.500	1.5°	4	●	
300	6.00	6.00	5.50	57	13.00	18.15	20.00	0.500	0.0°	4	●	
388	8.00	8.00	7.40	63	19.00	23.63	26.00	0.500	0.0°	4	●	
448	10.00	10.00	9.20	72	22.00	27.99	31.00	0.500	0.0°	4	●	
498	12.00	12.00	11.00	83	26.00	33.29	37.00	0.500	0.0°	4	●	
606	16.00	16.00	15.00	92	32.00	38.73	43.00	0.500	0.0°	4	●	

Corner radius end mills HX-RNVS

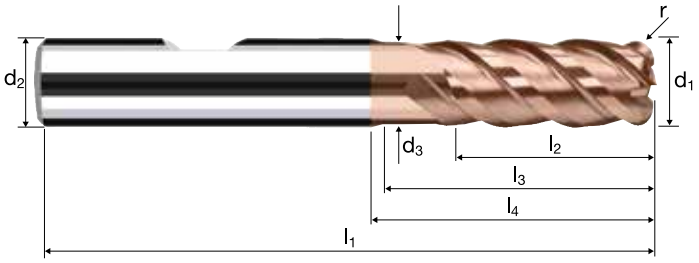
Smooth-edged, normal version with short neck
High-performance penetration edge

X-Generation

HM
XA

λ 45°
γ -10°

new!



Roughing HPC | Roughing HDC | Finishing

HRC 48-56 | HRC 56-60 | HRC > 60 | HSS

Example: **Order-N°.** Coating **H** | Article-N°. **8607** | ø-Code **302**

Ø Code	d_1 0/-0.01	d_2 h4	d_3	l_1	l_2	l_3	l_4	r 0/+0.015	α	z	DURO-Si H8607	DURO-Si H8507
302	6.00	6.00	5.50	57	13.00	18.15	20.00	1.000	0.0°	4	●	
391	8.00	8.00	7.40	63	19.00	23.63	26.00	1.000	0.0°	4	●	
450	10.00	10.00	9.20	72	22.00	27.99	31.00	1.000	0.0°	4	●	
501	12.00	12.00	11.00	83	26.00	33.29	37.00	1.000	0.0°	4	●	
608	16.00	16.00	15.00	92	32.00	38.73	43.00	1.000	0.0°	4	●	
304	6.00	6.00	5.50	57	13.00	18.15	20.00	1.500	0.0°	4	●	
395	8.00	8.00	7.40	63	19.00	23.63	26.00	2.000	0.0°	4	●	
457	10.00	10.00	9.20	72	22.00	27.99	31.00	2.500	0.0°	4	●	
507	12.00	12.00	11.00	83	26.00	33.29	37.00	3.000	0.0°	4	●	

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