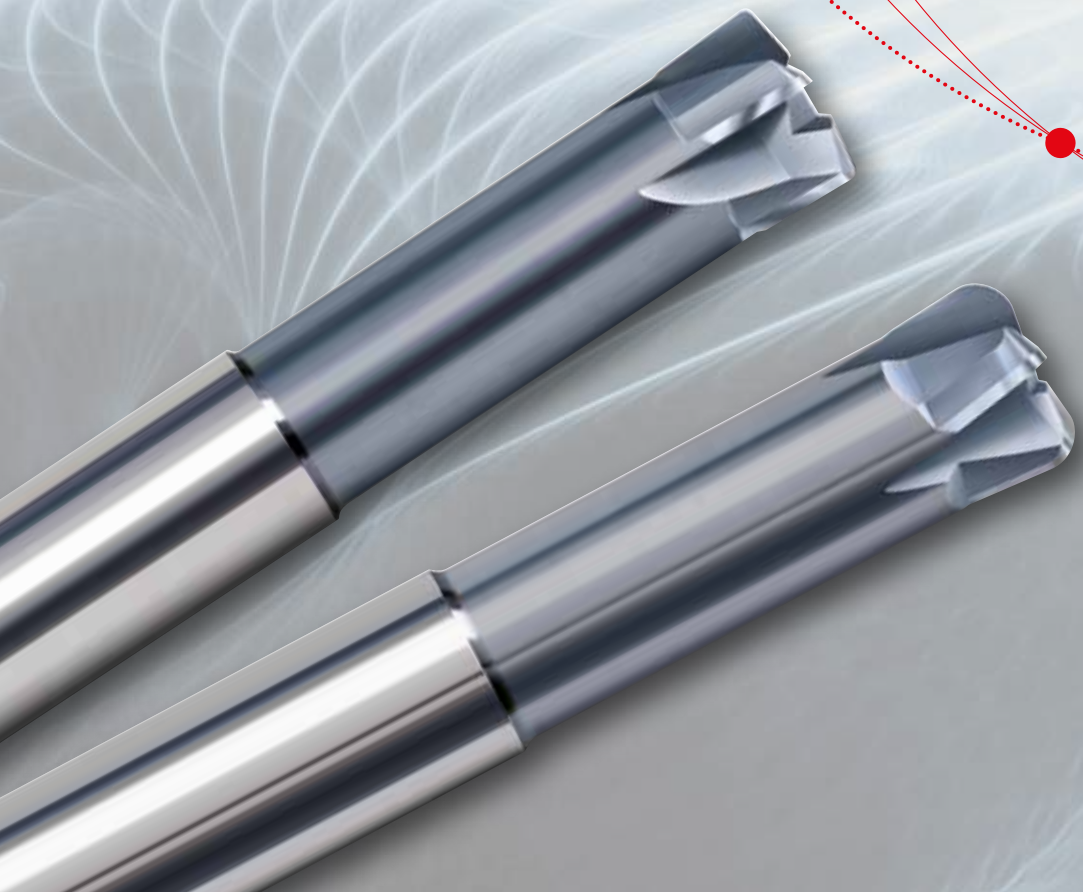
passion
for precision

fraisa

High Feed Cutting HFC
XFeed and XFeed-R

NEW



XFeed and XFeed-R
Specialists for high feed machining

The high feed end mills **XFeed** and **XFeed-R** were developed for the perfect execution of HFC processes in high-tensile and hardened steels. The strategy of High Feed Cutting (HFC) is characterised by very high feed rates, high cutting speeds and low axial working depths. The HFC concept permits efficient and quick production of 3D-contours step by step in hardened steel materials.

The new HFC end mills are preferably used in high feed processes where high metal removal rates need to be implemented using the highest feed rates. This applies particularly with high-tensile steels.

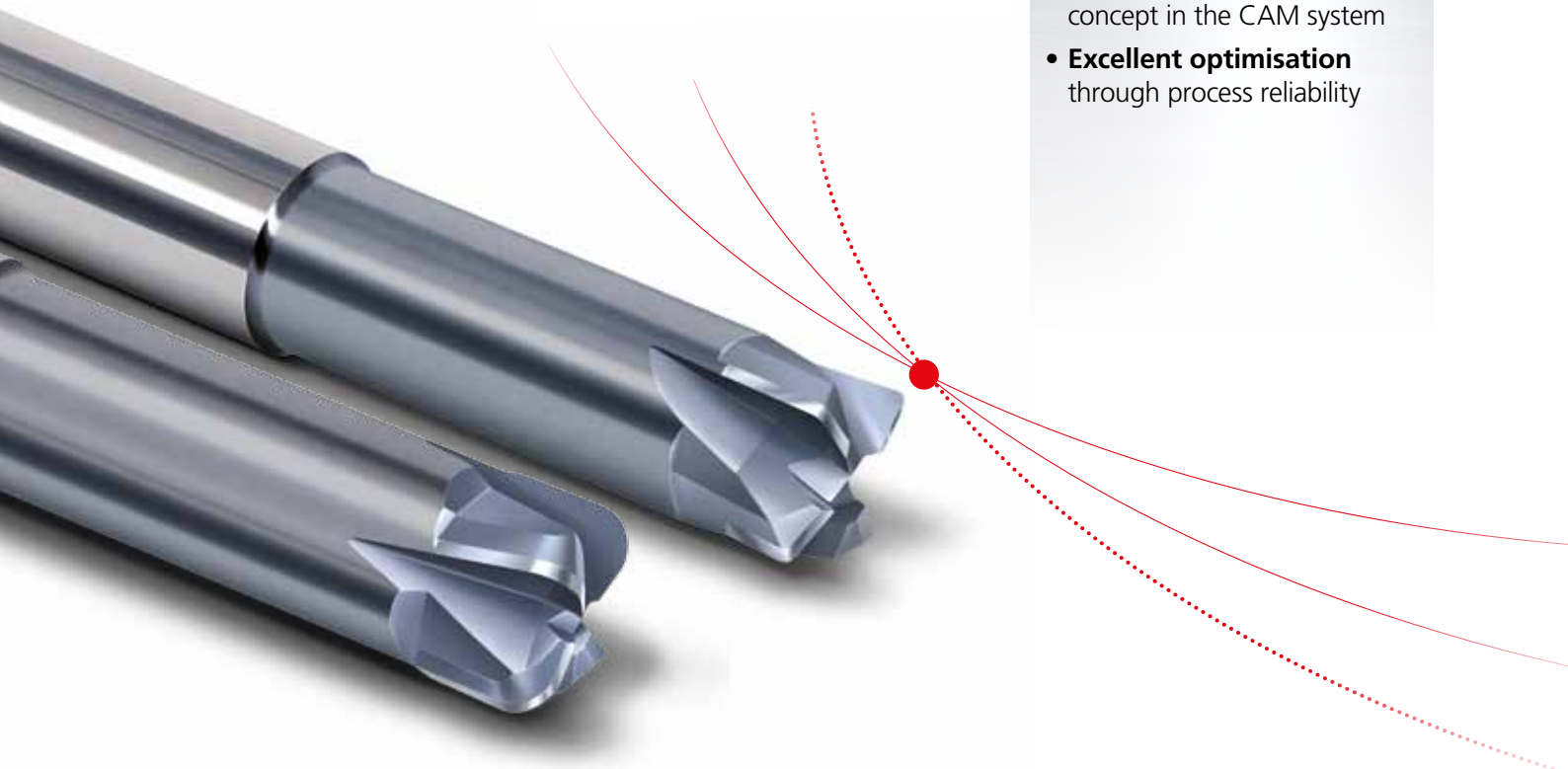
Therefore, the FRAISA HFC end mills are especially suited for the production of moulds and dies and the machining of high-tensile and hardened steels.

The advantage of the HFC end mills is their high productivity at low tool costs. This becomes particularly apparent when highly dynamic machines are used and high feed rates can be attained. Moreover, the use of the FRAISA HFC end mills facilitates the optimisation of HFC processes.

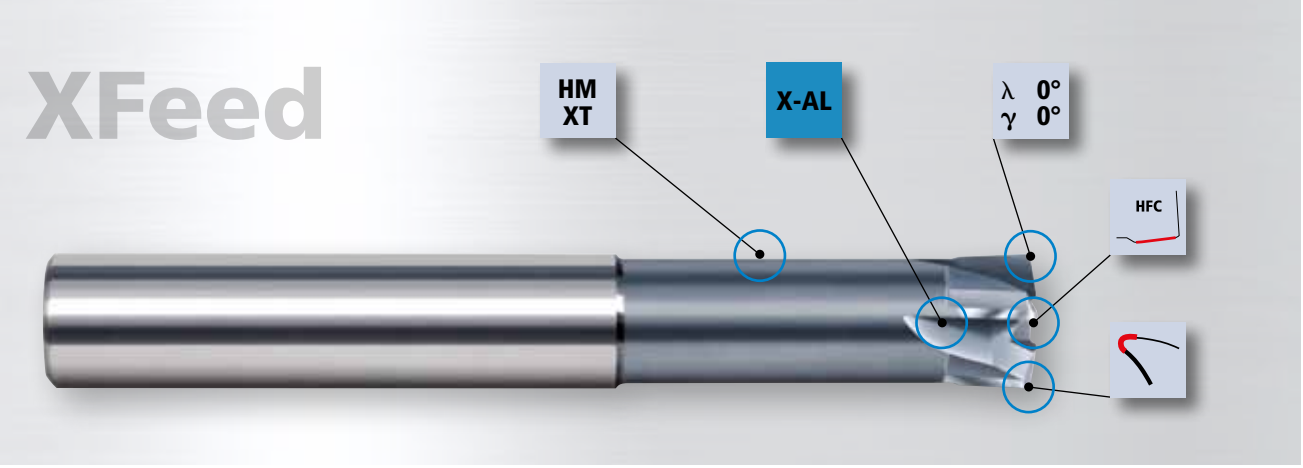
Compared to conventional milling tools, the HFC tools **XFeed-R** and **XFeed** are exclusively used for face milling operations. The cutting edge geometry adapted for this strategy; the substantially harder carbide substrate; a coating created with high hardness and resistance to high mechanical load as well as specific cutting edge conditioning all ensure the highest efficiency in machining.

The advantages:

- **Shorter lead times:** Workpieces can be efficiently machined in their hardened condition from the blank to the final contour in one setup. This drastically reduces the cycle time
- **Improved productivity** due to higher metal removal rates achieved by using the highest feed rates and robust tool design
- **Good final contour** due to small axial steps during roughing operations
- **Easy programming** due to the simple programming required for the XFeed-R concept in the CAM system
- **Excellent optimisation** through process reliability



Innovation and technology in the XFeed range



HM XT — **HM-XT ultra hard cutting material**
- increases resistance to tool wear

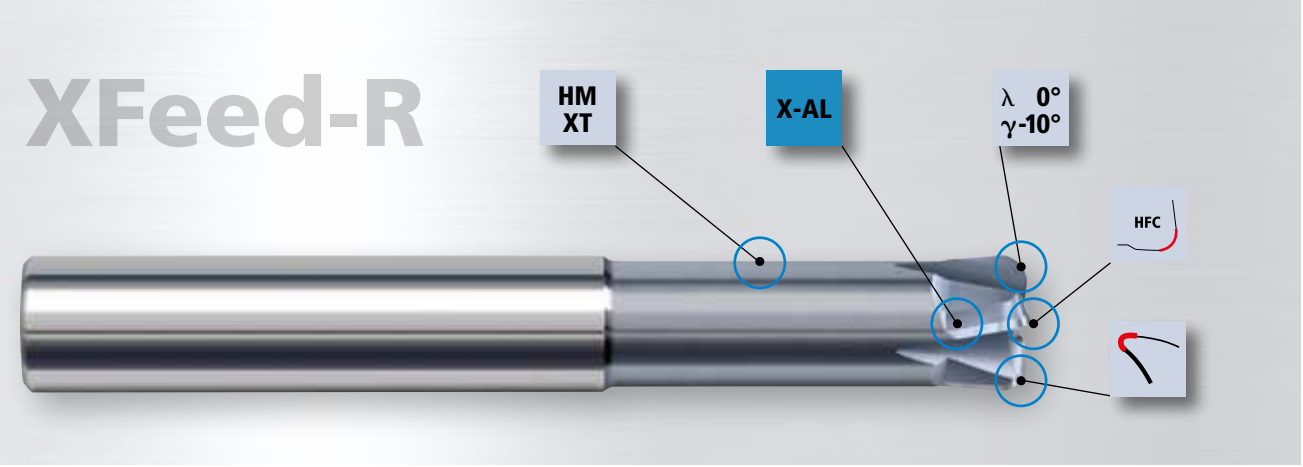
λ 0° γ 0° — **Robust face cutting edge**
- combines cutting efficiency and stability

HFC — **HFC face geometry**
- permits high feed rates

Cutting edge preparation
- stabilises the cutting edge
- resists chipping of the cutting edge

X-AL — **Proven X-AL coating**
- markedly reduces abrasive wear

Innovation and technology in the XFeed-R range



HM XT — **HM-XT ultra hard cutting material**
- increases resistance to tool wear

λ 0° γ-10° — **Stabilised cutting wedge**
- reduces the risk of chipping

HFC — **HFC-R geometry**
- permits high feed rates
- easy programming

Extreme conditioning
- resists breakage of the cutting edge
- withstands high forces

X-AL — **Proven X-AL coating**
- markedly reduces abrasive wear

XFeed and XFeed-R

For the perfect implementation of HFC machining of hardened steels

Higher productivity

XFeed:
The shape of the end face cutting edges of the **XFeed** tool facilitates a huge increase of the effective cutting edge length. Thus, the mechanical load and wear on the end cutting surfaces is evenly distributed. As a consequence feed rate and metal removal rate can be increased significantly. The forces caused by the higher feed rate can be withstood without problems.

The residual material created by the angular end face cutting edge geometry can easily be removed by a subsequent prefinishing operation.

XFeed-R:
When using the **XFeed-R**, the cutting edge withstands the forces in the area of the radius. As a result of this radius, the length of the cutting edge is reduced by approximately a half. The tool geometry can easily be accommodated by CAM systems and a 3D machined surface that closely follows the final contour is assured.

The special design of the end face cutting edge geometry can withstand high forces over a small contact length. The shape of the cutting edge resembles a waterfall and is ideally adapted to the load spectrum. Due to the shorter contact length, the attainable feed values are slightly less compared to the **XFeed**, therefore selected feed rates are around 20% lower.

Greater optimisation

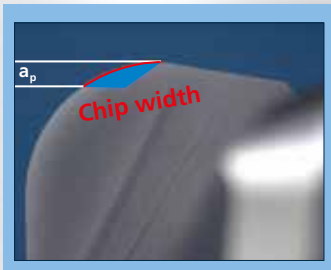
A special cutting edge preparation ensures cutting edge stability. In particular, the slot less design of the tool geometry and resulting stability make the FRAISA **XFeed** and **XFeed-R** end mills ideally suited to optimised processes. Especially for applications where total reliability is a mandatory requirement for unmanned production.

Cutting edge geometry of XFeed

Significant increase in feed rate by extending the cutting edge length.

Eff. cutting edge length ≈ 6 x a_p

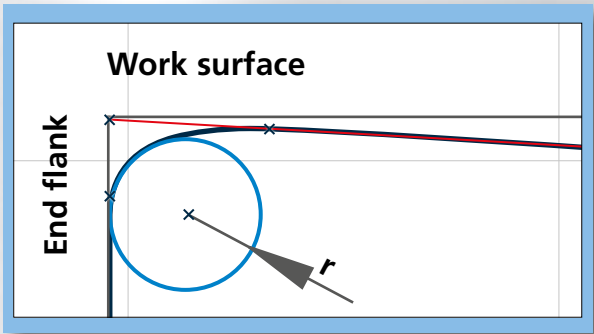
Cutting edge geometry of XFeed-R



Lower increase in the feed rate compared to the XFeed, however better contour result and easier programming in the CAM system.

Eff. chip width ≈ 3,6 x a_p

Cutting edge of XFeed-R



Shorter lead times

In conventional processing, mould blanks are machined in the soft condition and then hardened with a material allowance for finish machining. This results in long downtime prior to and after the hardening process. With the HFC end mills the entire machining process can be performed when the material is in the hardened condition. Thereby significantly reducing the total production time of the mould.

Good alignment with final contour

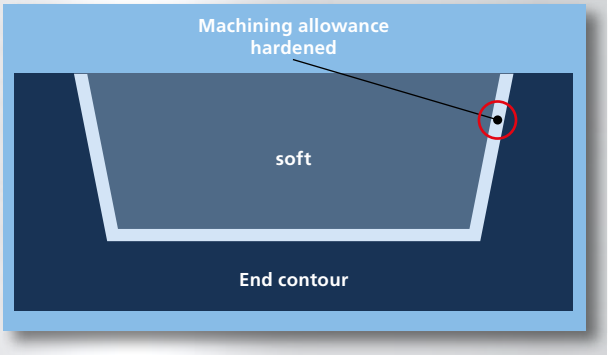
The small axial depths of cut generate a roughed surface on the hardened workpiece closely aligned to the final contour. This not only saves time, but also costs.

XFeed series

The **XFeed** range of end mills comprises three length versions that include 3xd, 6xd and 9xd.

The **XFeed-R** end mills are offered in two lengths and a size range of Ø6-Ø12. The corner radii are adapted to the machining forces and represent 20% of the tool diameter. For the sake of precision, these end mills are available only with a smooth shaft.

Conventional process steps



1. soft machining
2. hardening of the pre-machined mould
3. final contour machining of the hardened mould

Reduction of process steps with HFC technology

1. hardening
2. roughing with XFeed end mills and subsequent finishing

Where is it possible to ask questions concerning the product?

If you have any question, please send an email to **mail.ch@fraisa.com**. You may also directly contact our local customer consultant.

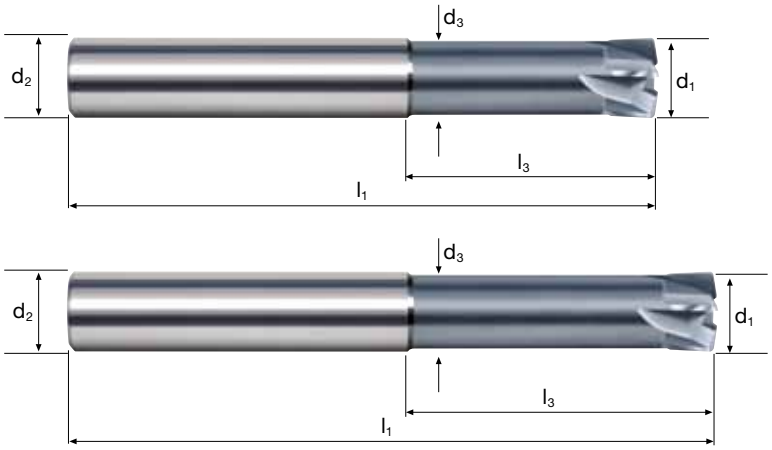
The FRAISA application engineers will be happy to advise you.

For further information, please refer to **fraisa.com**

High feed end mill XFeed

Cylindrical neck, 3xd and 6xd

HM XT	λ 0° γ 0°
	HFC



Rm < 850	Rm 850–1100	Rm 1100–1300	Rm 1300–1500	HRC 48–56	HRC 56–60	HRC > 60		Ti Titanium	HSS GG(G)

Example: **Order-N°.** Coating **X** Article-N°. **7600** Ø-Code **.180**

Ø-Code	d_1 e8	d_2 h6	d_3	l_1	l_3	$ap_{max.}$	$R_{theo.}$	α	Z		X-AL / X7600
.180	3	6	2.8	57	9	0.12	0.27	6.0°	4		•
.220	4	6	3.7	57	12	0.16	0.36	3.8°	4		•
.260	5	6	4.6	57	15	0.20	0.45	1.8°	4		•
.300	6	6	5.5	57	20	0.25	0.54	0.0°	4		•
.391	8	8	7.4	63	26	0.33	0.72	0.0°	4		•
.450	10	10	9.2	72	31	0.41	0.90	0.0°	4		•
.501	12	12	11.0	83	37	0.50	1.08	0.0°	4		•
.610	16	16	15.0	92	43	0.69	1.44	0.0°	4		•

Example: **Order-N°.** Coating **X** Article-N°. **7604** Ø-Code **.180**

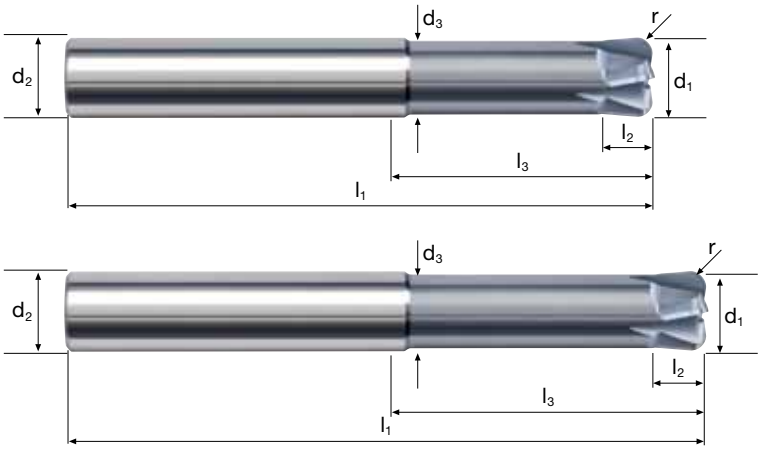
Ø-Code	d_1 e8	d_2 h6	d_3	l_1	l_3	$ap_{max.}$	$R_{theo.}$	α	Z		X-AL / X7604
.180	3	6	2.8	66	18	0.12	0.27	3.7°	4		•
.220	4	6	3.7	69	24	0.16	0.36	2.1°	4		•
.260	5	6	4.6	75	30	0.20	0.45	1.0°	4		•
.300	6	6	5.5	80	43	0.25	0.54	0.0°	4		•
.391	8	8	7.4	90	53	0.33	0.72	0.0°	4		•
.450	10	10	9.2	105	64	0.41	0.90	0.0°	4		•
.501	12	12	11.0	120	74	0.50	1.08	0.0°	4		•
.610	16	16	15.0	135	86	0.69	1.44	0.0°	4		•

Other versions can be found in our “High-performance milling tools 2014/15” catalogue

High feed end mill XFeed-R

Cylindrical neck, 3xd and 6xd

HM XT	λ 0° γ -10°
	HFC



	Rm 850–1100	Rm 1100–1300	Rm 1300–1500	HRC 48–56	HRC 56–60	HRC > 60			HSS GG(G)

Example: **Order-N°.** Coating **X** Article-N°. **7620** Ø-Code **.300**

Ø-Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	r	Z		X-AL
										X7620
.300	6	6	5.5	57	3	20	1.0	4		•
.391	8	8	7.4	63	4	26	1.5	4		•
.450	10	10	9.2	72	5	31	2.0	4		•
.501	12	12	11.0	83	6	37	2.5	4		•

Example: **Order-N°.** Coating **X** Article-N°. **7624** Ø-Code **.300**

Ø-Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	r	Z		X-AL
										X7624
.300	6	6	5.5	80	3	43	1.0	4		•
.391	8	8	7.4	90	4	53	1.5	4		•
.450	10	10	9.2	105	5	64	2.0	4		•
.501	12	12	11.0	120	6	74	2.5	4		•

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