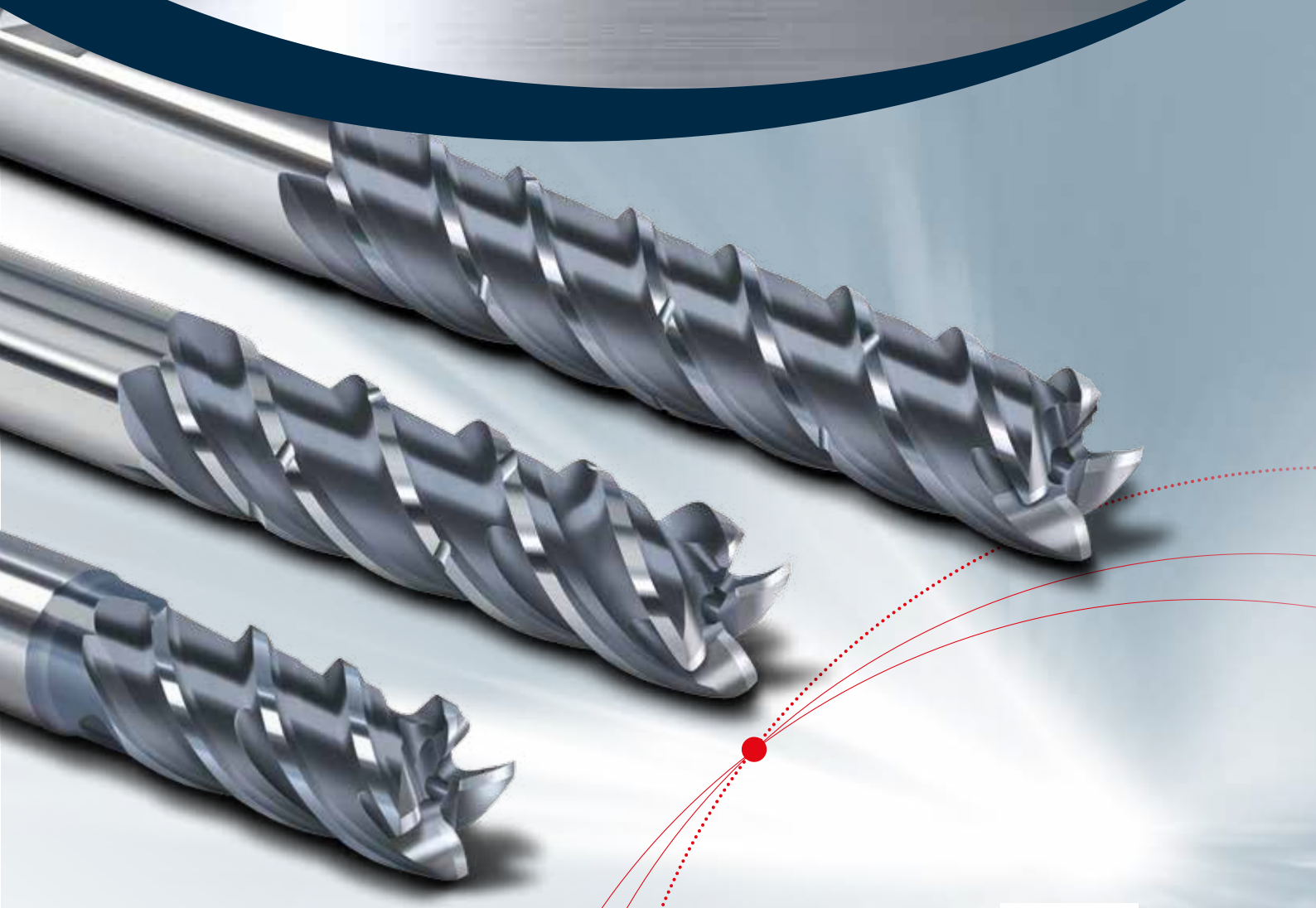
passion
for precision

fraisa

Multi-functional Cutting MFC

The solution for easy-cut and highly dynamic applications



New cutting data calculator

ToolExpert MFC

MFC – up to 96 different applications per tool

Easy-cut and dynamic up to 5.2xd deep

The multi-functional **MB-NVDS (MFC)** tools launched last year are extremely popular. Each MFC tool enables **up to 96 different applications** to be handled, allowing users to achieve significant reductions in inventory and machine setup costs as well as tool change times – and r**educe their production costs long-term.**

Thanks to the **high degree of market acceptance of MB-NVDS (MFC)** tools, the **MB-NVDS** tool family has been expanded. While the MB-NVDS tools already available on the market are exhibiting excellent performance in finishing and conventional HPC roughing operations, the new family members are focused on **HDC (High Dynamic Cutting).**

That is, these tools, with their very robust cutting edge geometry, are ideally suited to penetrating and milling out the component using the entire length of the cutting edge.

The cutting profile of the new **MB-NVDS** tools has been designed with a more positive edge. A **cutting angle of 10° and a treated cutting edge** result in a soft and low-vibration cut that in turn **reduces machining forces, power consumption and torque input.** With the aid of the redesigned double groove and continuous polished teeth, it is now possible to absorb **greater thermal and mechanical loads during HDC trochoidal machining.**

The new **MB-NVDS 5.2xd version can be used to make deep holes** and to achieve **extremely high material removal rates** when HDC-S milling.

The **ToolExpert MFC** software developed specifically for the **MFC** family has been updated with the many new applications possible and now provides an outstanding overview of the broad range of uses of this truly **unique MB-NVDS (MFC) tool family.**

The advantages

- **Reduced logistics and inventory costs,**
  because one tool can be used for many different applications
- **Shorter machine setup times**
  thanks to a much reduced variety of tool variants
- **Reduced capital commitment**
  for tools and tool holders
- **High process reliability**
  thanks to guaranteed chip removal via a central air and cooling channel
- **Reduced loads and lower energy consumption**
  thanks to smooth cutting and optimum chip removal
- **Optimized program cycles and performance**
  because ToolExpert MFC supplies precise application data
- **Optimum life cycle**
  with ToolCare® tool management, ReTool® tool reconditioning and ReToolBlue recycling

Wird in USA nicht angeboten

Challenge and targets for production

The big **challenge** facing production departments today is to obtain the optimum combination of milling strategy and tool in the existing infrastructure as quickly as possible.

While doing so, various **targets** constantly need to be taken into account if a company's competitiveness is to be further improved:

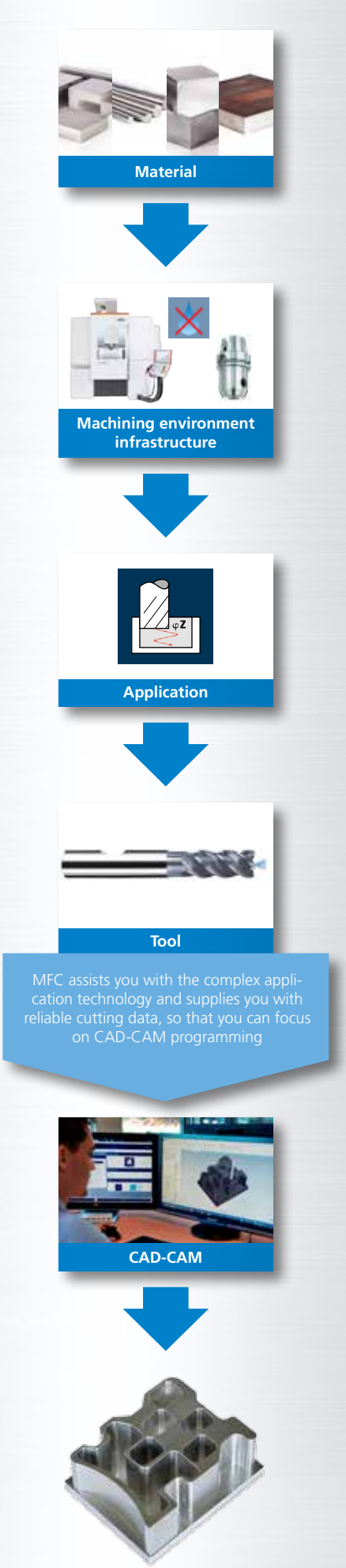
- More productivity, better performance and longer tool life
- Greater process reliability and reproducibility
- Increased automation
- Better component quality
- Shorter machine setup times and faster use
- Fewer operating costs and investments
- Greater sustainability/sparing use of resources
- Greater application know-how
- Greater flexibility
- Simplification and standardization

Mastering this complexity represents a core competence and key activity for manufacturers because it is here that actual value is added. The faster, more easily and more reliably a new application can be solved, the **more competitive and profitable production becomes.**

MFC solution for successful production

This is where **Multi-functional Cutting (MFC)** comes into its own. The goal of MFC product development is to reduce these complexities without compromising on performance.

Thanks to MFC, the customer is able to focus fully on their **competency in CAM programming** and enhance their competitiveness even more in the process!



The technologies behind the new MB-NVDS (MFC) tools

New technologies have a clear goal: They have to offer the user a number of definite benefits. To achieve this, only as many technologies as necessary are built into the tools, in order to obtain the best price-performance ratio. This also includes the application recommendations and cutting data that FRAISA develops at the same time as the tool technology.

All MB-NVDS technologies of the new MFC tools at a glance

Standard version

Medium-long version

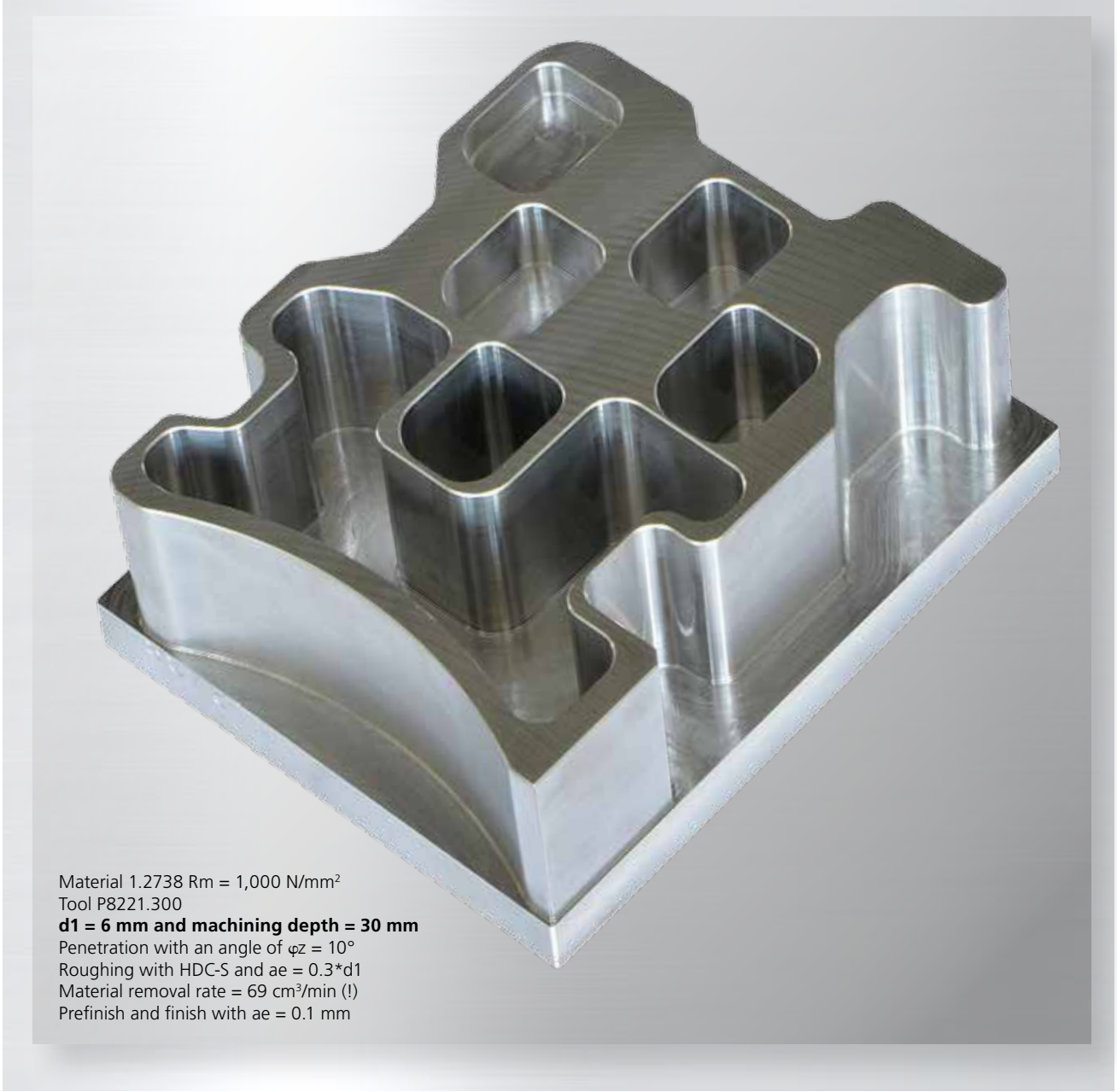
Extra-long 5.2xd version

Version	λ 45° γ 10°	r	Vario								
Standard	■	■	■	■	■	■	■	■		■	■*
Medium-long	■	■	■	■	■	■	■	■			■*
Extra-long	■	■	■	■	■	■	■		■		■

Detailed descriptions of each of the technologies can be found in the FRAISA catalog.

* Optionally = 12 mm for the standard version as of d1; = 6 mm for the medium-long version as of d1.

Fully milled component machined using MB-NVDS 5.2xd



MFC with machining depths of up to 5.2xd using extra-long version with cutting edge length of 5.2xd

- Penetration using the FRAISA penetration edge and central air and cooling channel
- Broader range of applications for complete machining
- Extremely high material removal rates when HDC-S machining

The component featured above was made using just one tool!

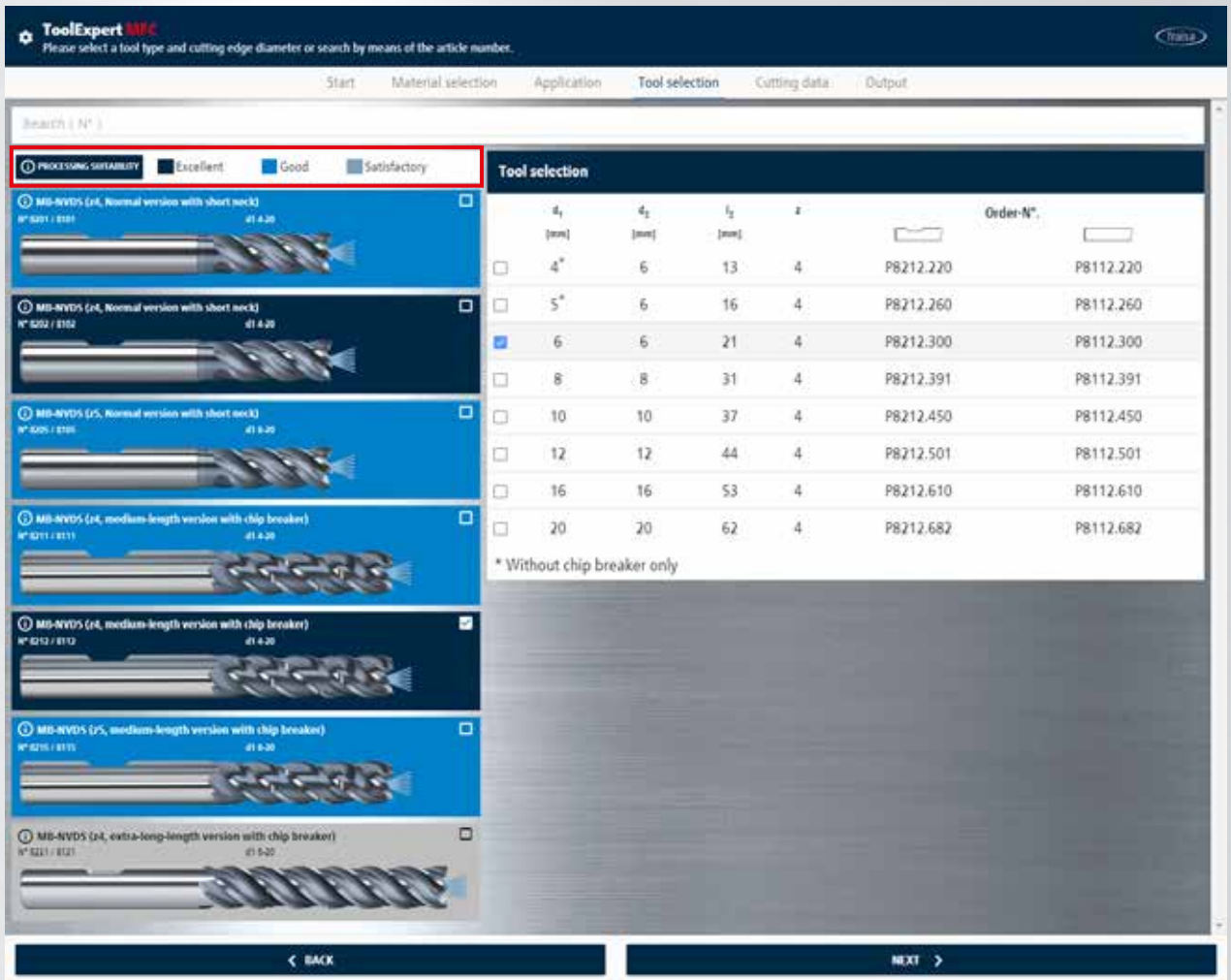
Reduced machining forces, power consumption and torque input thanks to soft and low-vibration cutting

- Mill with a 10° cutting angle and treated cutting edge
- Up to 25% reduction in axial extraction force and up to 20% lower power consumption and torque input
- Better performance in soft structural steel and steel < 850 N/mm2
- Milling with weak chucking or thin-walled components
- Lower energy consumption and spindle load

ToolExpert MFC and application technology
Knowledge of the application

In addition to developing the new **MB-NVDS-MFC** mills with 10° cutting angle, we have also compiled comprehensive cutting data that we have incorporated into the new version of **ToolExpert MFC**. With just a few clicks, you select the material, application and tool and obtain the parameters that need to be programmed for your machine control or CAM system.

ToolExpert MFC – Helping you select the right tool



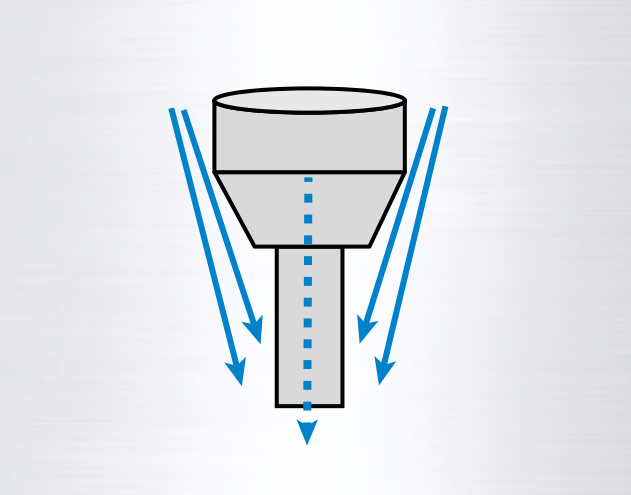
The latest version of ToolExpert MFC now features color coding to help you select the right tool for the job

When selecting the tool you require, ToolExpert MFC provides you with information on the performance index and application areas. The new MB-NVDS mills with 10° cutting angle and treated cutting edge are ideally suited to HDC milling. The existing MB-NVDS mills (8102/8202 and 8105/8205) are ideally suited to HPC milling. This allows you to match the MFC tools perfectly to your machine environment and application.

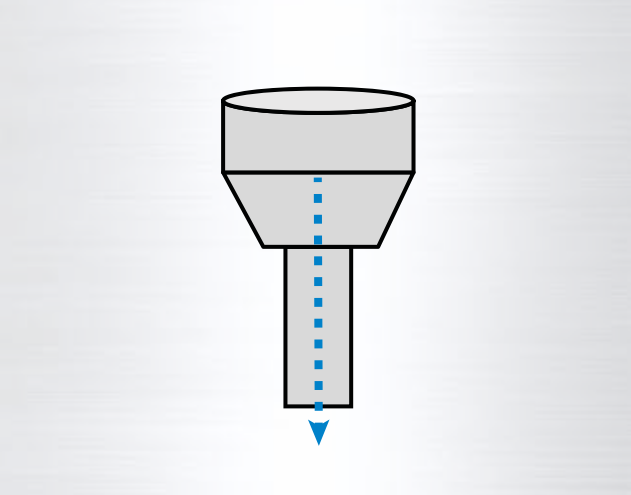
Central air and cooling channel

All MFC tools have a central air and cooling channel. In combination with the penetration edge, this channel ensures maximum process reliability and performance, because the chips are immediately removed upwards and away from the area of the penetration edge. Nevertheless, FRAISA recommends that coolant is delivered internally when making penetration depths greater than 1.5xd.

Milling outer and inner contours and penetrating up to 1.5xd



Penetrating depths as of 1.5xd



HDC (High Dynamic Cutting) milling

HDC milling offers greater productivity, process reliability and lower loads than HPC milling. However, the faster cutting speeds mean that the processing temperatures are considerably higher. Depending on the component being milled, the working length is longer or shorter and this has a direct impact on the temperature. Reduce or increase the cutting speed in order to regulate the processing temperature; this also enables you to control the amount of tool wear.

Long working length

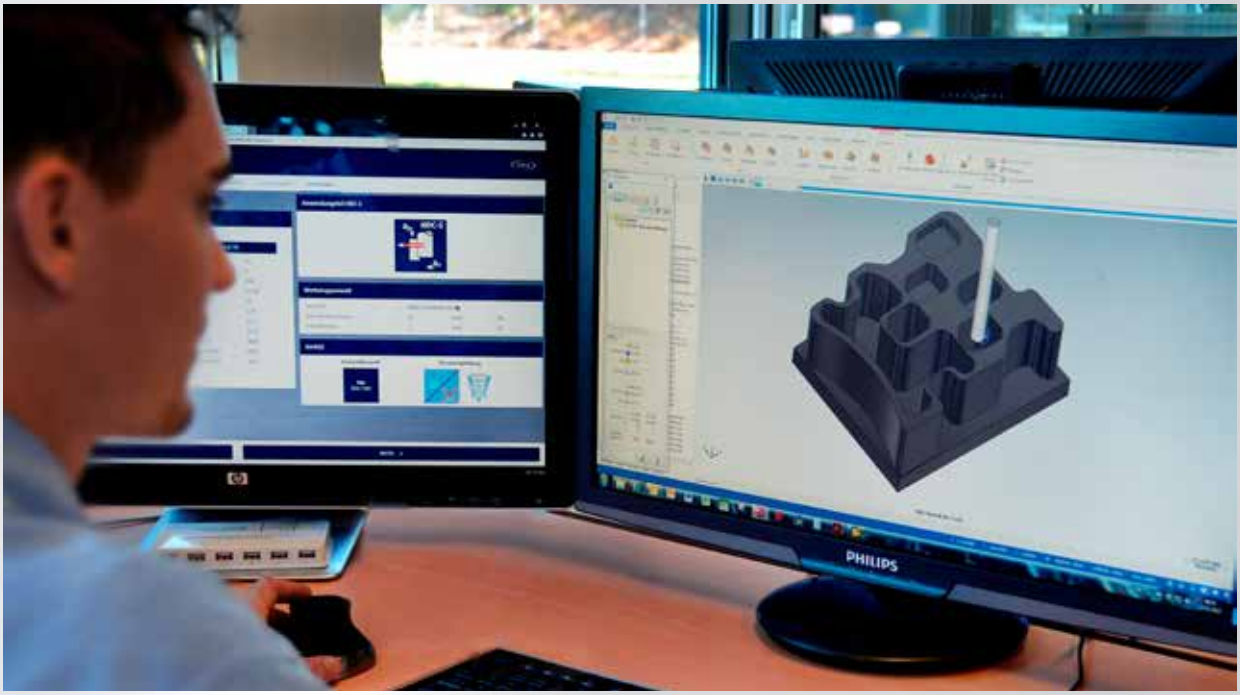
Short working length

Scan this QR code to go to the new cutting data software **ToolExpert MFC**

Using state-of-the-art CAD-CAM systems to gain a competitive edge

The CAD-CAM system assigns the type of application and the milling strategy to the component to be machined. State-of-the-art CAD-CAM systems enable a multitude of different machining strategies. High Dynamic Cutting (HDC, aka trochoidal milling) has been implemented in many CAD-CAM systems recently. This process offers significant economic advantages and is a real alternative to High Performance Cutting (HPC) and High Feed Cutting (HFC).

CAD-CAM competence as a competitive advantage



The competitive advantage is to be found in the knowledge of which machining strategy is ideal in respect of productivity, safety, quality and the machine environment. The programmer's own knowledge of the possibilities offered by their infrastructure also plays a crucial role.

In order to further improve coordination between the infrastructure and use of the CAD-CAM system, FRAISA includes this key element in its regular cutting seminars. Conversations with participants at these seminars reveal that there is a great deal of performance potential still to be teased out.

Cylindrical end mills MB-NVDS

Smooth-edged, normal version with short neck
High-performance penetration edge with central air/cooling channel

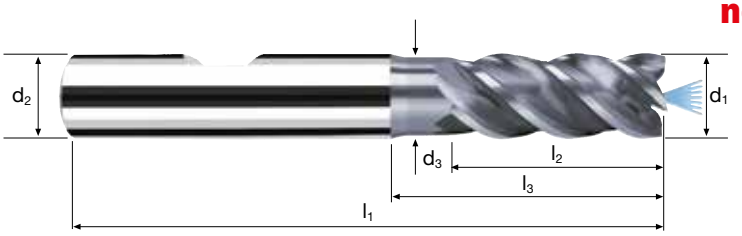
HSS | Favora® | Base-X **B** | X-Generation

HM MG10 | λ 45° γ 10°

r

Vario

new!



Roughing HPC | Roughing HDC | Finishing

Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8201** ø-Code **.220**

ø Code	d1 e8	d2 h6	d3	l1	l2	l3	r	α	z	POLYCHROM P8201	POLYCHROM P8101
.220	4	6	3.7	57	8	16	0.10	3.0°	4		●
.260	5	6	4.6	57	10	18	0.10	1.5°	4		●
.300	6	6	5.5	57	12	20	0.10	0.0°	4		●
.391	8	8	7.4	63	19	26	0.15	0.0°	4		●
.450	10	10	9.2	72	23	31	0.20	0.0°	4		●
.501	12	12	11.0	83	27	37	0.20	0.0°	4		●
.503 *	12	12	11.0	83	27	37	0.20	0.0°	4		●
.610	16	16	15.0	92	32	43	0.20	0.0°	4		●
.612 *	16	16	15.0	92	32	43	0.20	0.0°	4		●
.682	20	20	19.0	104	39	53	0.20	0.0°	4		●
.684 *	20	20	19.0	104	39	53	0.20	0.0°	4		●

* with chip breaker

Cylindrical end mills MB-NVDS

Smooth-edged with chip breaker, medium length version
High-performance penetration edge with central air/cooling channel

HSS | Favora® | Base-X | B | X-Generation

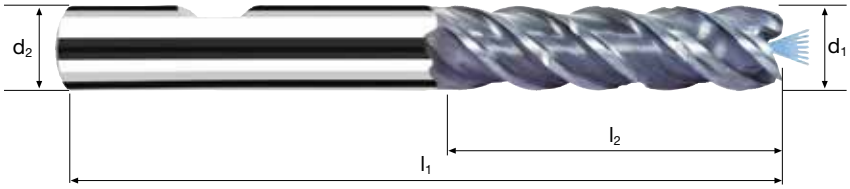
HM MG10

λ 45°
γ 10°

r

Vario

new!



Roughing HPC

Roughing HDC

Finishing

Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel

Example: **Order-N°.** Coating **P** Article-N°. **8211** ø-Code **.220**

[10]

ø Code	d1 e8	d2 h6	l1	l2	r	α	z	POLYCHROM P8211	POLYCHROM P8111
.220*	4	6	63	13	0.10	3.5°	4		●
.260*	5	6	63	16	0.10	1.5°	4		●
.300	6	6	63	21	0.10	0.0°	4		●
.391	8	8	72	31	0.15	0.0°	4		●
.450	10	10	84	37	0.20	0.0°	4		●
.501	12	12	97	44	0.20	0.0°	4		●
.610	16	16	108	53	0.20	0.0°	4		●
.682	20	20	122	62	0.20	0.0°	4		●

* without chip breaker only

Cylindrical end mills MB-NVDS

Smooth-edged with chip breaker, extra-long version 5.2xd
High-performance penetration edge with central air/cooling channel

HSS | Favora® | Base-X **B** | X-Generation

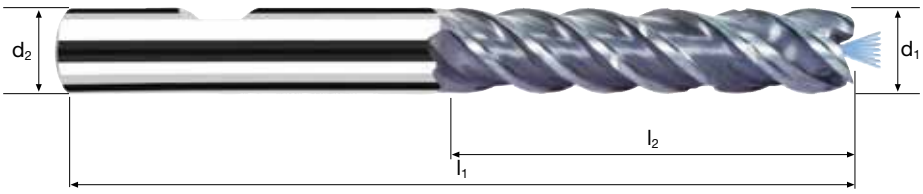
HM MG10

λ **45°**
γ **10°**

r

Vario

new!



Roughing HPC

Roughing HDC

Finishing

Rm < 850	**Rm** 850-1100	**Rm** 1100-1300	**Rm** 1300-1500	**HRC** 48-56			**Inox** Stainless	**Ti** Titanium	**GG(G) Tool Steel**

Example: **Order-N°.** Coating **P** Article-N°. **8221** ø-Code **.300**

ø Code	d1 e8	d2 h6	l1	l2	r	z		POLYCHROM P8221	POLYCHROM P8121
.300	6	6	73	32	0.10	4			●
.391	8	8	84	42	0.15	4			●
.450	10	10	101	53	0.20	4			●
.501	12	12	117	63	0.20	4			●
.610	16	16	144	84	0.20	4			●
.682	20	20	169	105	0.20	4			●

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