

passion
for precision



ArCut X – for brilliant surfaces in next to no time



New:
ToolExpert
ArCut X
cutting data calculator

ArCut X is a productivity booster for finishing with excellent surface quality

Do you finish flat surfaces with a ball nose end mill? Do you ever wonder why the machining times are so long?

Then we've got great news for you! The new **ArCut X** tool concept from FRAISA has arrived!

ArCut X is a conical end mill whose curved surface area has a radius of curvature of up to 1,000 mm. Thanks to this large radius of curvature, it's possible to realise larger step-over distances without any significant impact on the theoretical scallop height. The result is highly precise surfaces with brilliant surface characteristics that can minimise the amount of time spent polishing. As the tip of the **ArCut X** milling cutter has a perfectly spherical form, it also offers all of the plus points of a robust ball nose end mill.

As such, FRAISA's innovative **ArCut X** tool concept integrates great finishing performance with almost perfect surface qualities and is therefore an exceedingly interesting tool concept for flat component surfaces.

The advantages of the **ArCut X** cutter compared with conventional ball nose end mills are enormous:

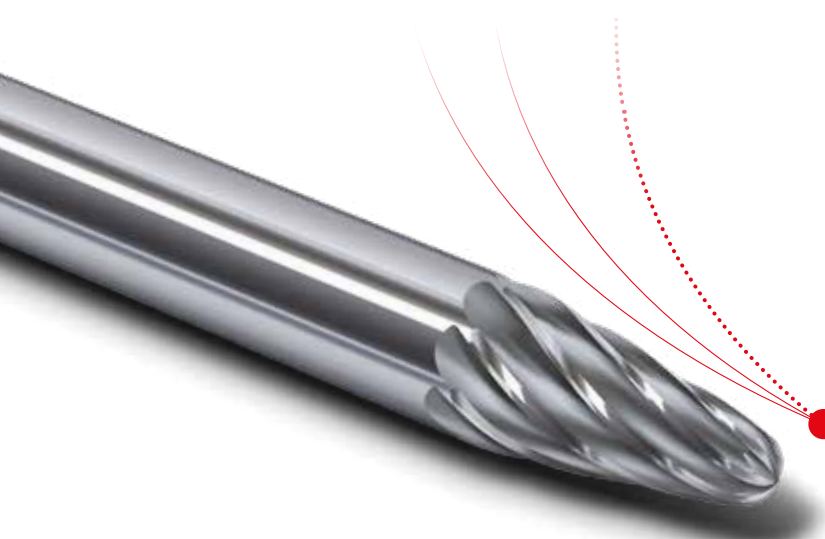
- The end face of the ball nose end mill is also suitable for corner radii at workpiece bottoms and walls
- The curved surface radius allows a very much larger step-over distance than a ball nose end mill
- Undesirable step effects are avoided
- The short tool results in high stability and less vibration
- Time savings of up to 90% compared with ball nose end milling

Bottom line: The **ArCut X** concept saves a huge amount of time and money!

The benefits:

- **Lower costs:**
Great finishing performance and rapid machining
- **Lower tool costs:**
Low wear because a longer section of the cutting edge is engaged.
- **High component quality:**
Low form tolerance of up to $\pm 5 \mu\text{m}$ on the cutter facilitates brilliant contour accuracy on the workpiece
- **Application:**
Exact and verified application parameters are available. The deliberately concise product portfolio covers a wide range of applications
- **ToolExpert ArCut X:**
for fast and easy provisioning of the cutting data.
- **FRAISA ReTool®-Service:**
Industrial tool reconditioning with performance guarantee.

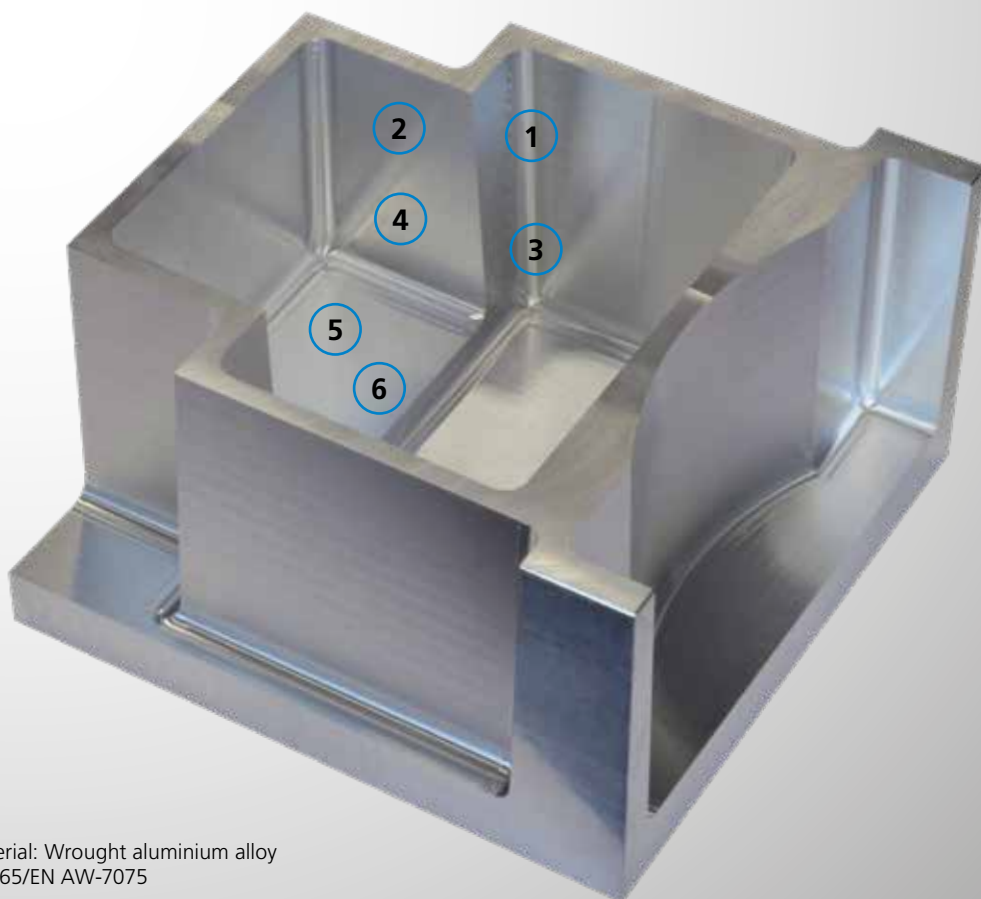
The fastest way to our FRAISA ReTool® video is to scan the QR code.





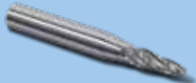







With its **ArCut X** tool concept, FRAISA offers a range of conical end mills in various versions that covers a broad spectrum of finishing processes.

In combination with the respective tool characteristics, the technologies facilitate a wide range of applications with a variety of materials.

Pre-Finishing/Finishing with ArCut X



Material: Wrought aluminium alloy
3.4365/EN AW-7075

Pre-Finishing		Finishing		Tools	
1	 PF Tool 1	3	 F Tool 1	Tool 1: 8530.388 ArCut X spherical, z4	
2	 PF Tool 1	4	 F Tool 1	Tool 2: 8550.140 ArCut X for finishing flat surfaces, z4	
5	 PF Tool 2	6	 F Tool 2	  See for yourself the impressive performance of the ArCut X cutter in our video.	

[4]

The new **ToolExpert ArCut X** is now a reliable aid to finding the perfect tool from the **ArCut X** family to suit the desired material and application. The clearly structured menu lets you select/read off the material, application, **ArCut X** tool type and the option “coated” or “uncoated”.

Similarly, using **ToolExpert ArCut X** you can also find the corresponding cutting data for the selected tool. The phenomenal range of options offered by the **ArCut X** can therefore be exploited to the full, thanks to the specially developed cutting data calculator.

Select the material



Select the application



Select the tool



NEW:
ToolExpert
ArCut X
cutting data calculator

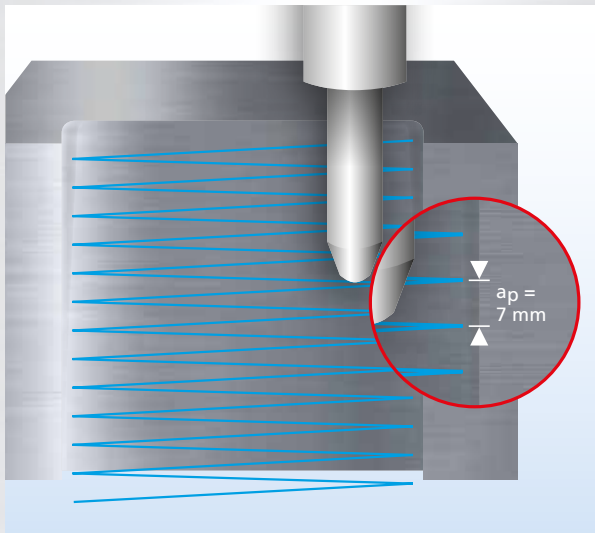
ToolExpert ArCut X

Finishing in record time

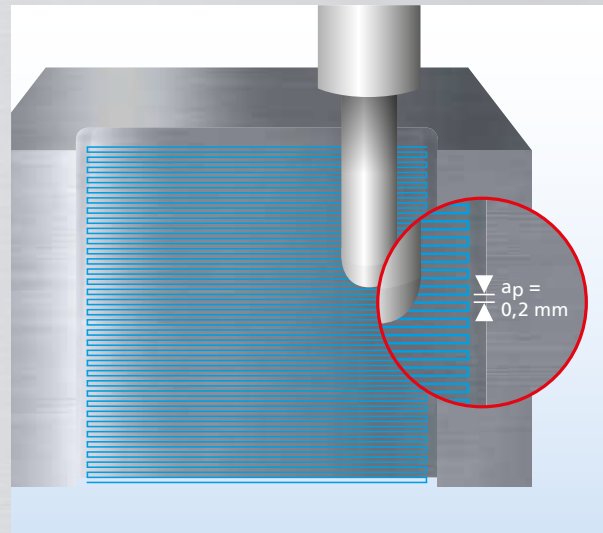
Use of **ArCut X** demands a powerful CAM solution that fully exploits the potential of their geometry. Most leading CAM providers have now developed service packages that fully exploit the advantages of conical circular arc milling cutters and are easy to program.

The large radii at the curved cutting edge enable flat surfaces with big step-overs to be cut with excellent surface qualities. The large radii at the curved cutting edge enable flat surfaces with greater step-over distances to be cut and huge time savings of up to 90%!

ArCut X vs. conventional ball nose end mill



Wide step-over distances = short machining times (ArCut X)



Short step-over distances = long machining times (ball nose end mill)

[5]

Benefits:

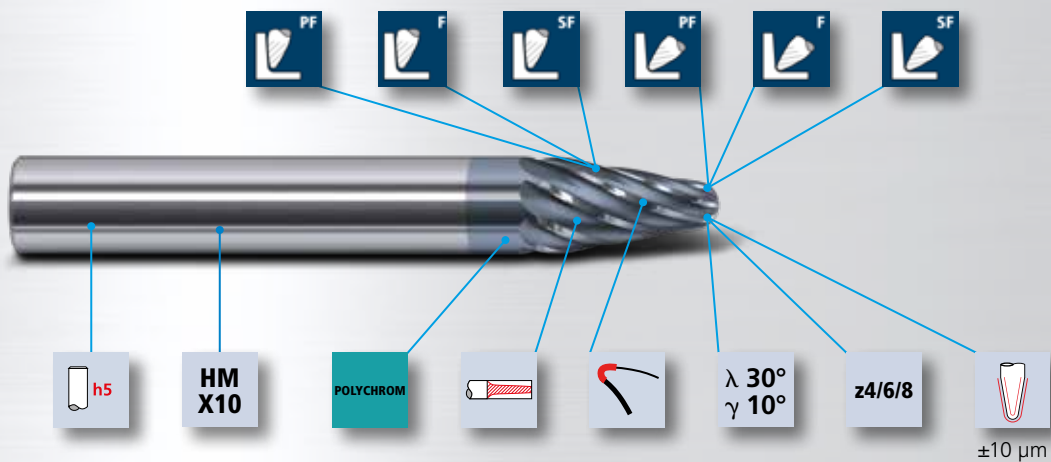
- **Short production times:** time savings of up to 90%
- **Longer tool life**
- **Optimum surfaces**
- **Top productivity**
- **Wide range of applications:** Mould & Die making, aerospace, tyre moulds, turbine blades and impellers



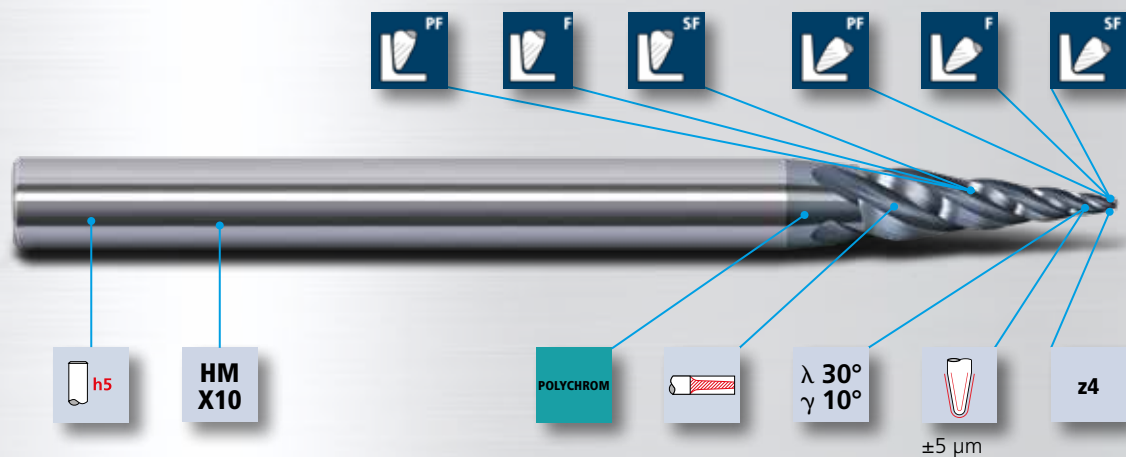
ArCut X **spherical** and **spherical, micro** for finishing of steep slopes and radius areas

The technologies of ArCut X spherical and spherical, micro

ArCut X spherical



ArCut X spherical, micro



A detailed description of each technology can be found on page 7 and an overview of the application suitability of each technology on page 9.

An overview of applications of ArCut X spherical and spherical, micro



Pre-Finishing (PF): Steep slopes

- Pre-finishing the sides and walls (flat & free-form surfaces) with the circular arc radius (curved surface area)
- Machining with an ArCut X cutter (spherical) with a conical angle of less than 40°
- Machining is performed by means of roll cutting parallel to the face of the workpiece



Finishing (F): Steep slopes

- Finishing the sides and walls (flat & free-form surfaces) with the circular arc radius (curved surface area)
- Machining with an ArCut X cutter (spherical) with a conical angle of less than 40°
- Machining is performed by means of roll cutting parallel to the face of the workpiece



Super-Finishing (SF): Steep slopes

- Super-finishing the sides and walls (flat & free-form surfaces) with the circular arc radius (curved surface area)
- Machining with an ArCut X cutter (spherical) with a conical angle of less than 40°
- Machining is performed by means of roll cutting parallel to the face of the workpiece



HSC Pre-Finishing (PF): Radius areas

- Pre-finishing the radii (convex & concave) with the ball radius
- High-speed cutting (HSC) with ArCut X cutter with a spherical tip
- Machining is performed by means of HSC cuts parallel to the face of the workpiece, draw and surge cuts



HSC Finishing (F): Radius areas

- Finishing the radii (convex & concave) with the ball radius
- High-speed cutting (HSC) with ArCut X cutter with a spherical tip
- Machining is performed by means of HSC cuts parallel to the face of the workpiece, draw and surge cuts



HSC Super-Finishing (SF): Radius areas

- Super-finishing the radii (convex & concave) with the ball radius
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[7]

An overview of all ArCut X technologies

**HM
X10**

HM X10 carbide

- Outstanding balance of hardness and ductility – maximum performance capability
- Micrograin carbide with a particularly homogeneous structure – guarantees the cutting edge attains a long life



Milling tool with increasing core diameter

- Improvement in tool rigidity and suppression of vibration – prevents chatter marks
- Superior performance for axial infeed ap and the feed rate fz

**λ 30°
γ 10°**

Helix angle and rake angle

The helix and rake angles have been chosen so that as wide a variety of materials as possible can be machined.

z8

z4/z6/z8

- Small numbers of teeth for pre-finishing result in a high removal rate
- Large number of teeth ensure excellent surface qualities after finishing

POLYCHROM

Heavy-duty POLYCHROM coating

- Wide application range in various materials, with dry and wet machining
- High thermal and mechanical resistance – high degree of process reliability
- Outstanding coating adhesion – longer tool life and performance capability



Milling tool 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



Dimensional accuracy

Dimensional accuracy of up to ± 0.005 mm guarantees great workpiece precision



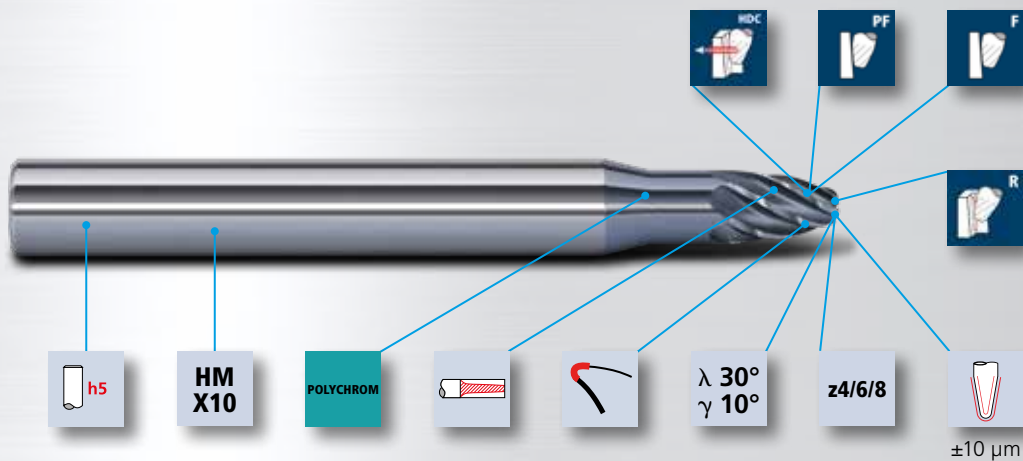
Precision shank

- High concentricity, ideal for modern precision toolholders

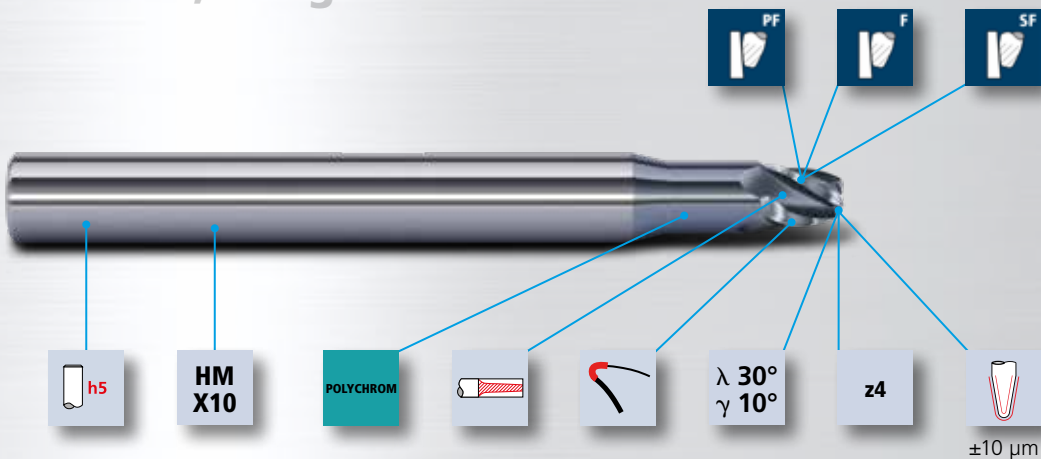
ArCut X **toric** and **toric, integral** for finishing of steep slopes and radius areas

The technologies of ArCut X toric and toric, integral

ArCut X toric



ArCut X toric, integral



A detailed description of each technology can be found on page 7 and an overview of the application suitability of each technology on page 9.

An overview of applications of ArCut X toric and toric, integral



HDC (Rest Material) Roughing: Corners

- HDC roughing of corners (rest material from previous 2.5D tools) with the circular arc radius (curved surface area)
- High dynamic cutting (HDC) with ArCut X cutter with a toric tip
- Machining is performed by means of trochoidal cuts (roll cutting)



HSC Roughing (R): Corners

- HSC roughing of corners and radii (rest material from previous 2.5D tools) with the tool corner radius
- High speed cutting (HSC) with ArCut X cutter with a toric tip
- Machining is performed by means of HSC draw and surge cuts



Pre-Finishing (PF): Steep slopes

- Pre-finishing the sides and walls (flat & free-form surfaces) with the circular arc radius (curved surface area)
- Machining with an ArCut X cutter (toric) with a conical angle of less than 40°
- Machining is performed by means of roll cutting parallel to the face of the workpiece



Finishing (F): Steep slopes

- Finishing the sides and walls (flat & free-form surfaces) with the circular arc radius (curved surface area)
- Machining with an ArCut X cutter (toric) with a conical angle of less than 40°
- Machining is performed by means of roll cutting parallel to the face of the workpiece



Super-Finishing (SF): Steep slopes

- Super-finishing the sides and walls (flat & free-form surfaces) with the circular arc radius (curved surface area)
- Machining with an ArCut X cutter (toric) with a conical angle of less than 40°
- Machining is performed by means of roll cutting parallel to the face of the workpiece

The fastest way to our **ToolExpert ArCut X** is to scan the QR code (<http://www.fraisa.com/qr/enw22>).



[9]

Overview of suitability for machining

Machining suitability of ArCut X tools without coating

Rm < 850			Al Aluminium >99%	Al Aluminium Alloy	Al Aluminium Cast		Cu Copper	Plastic Thermoplast	
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Machining suitability of ArCut X tools with coating

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

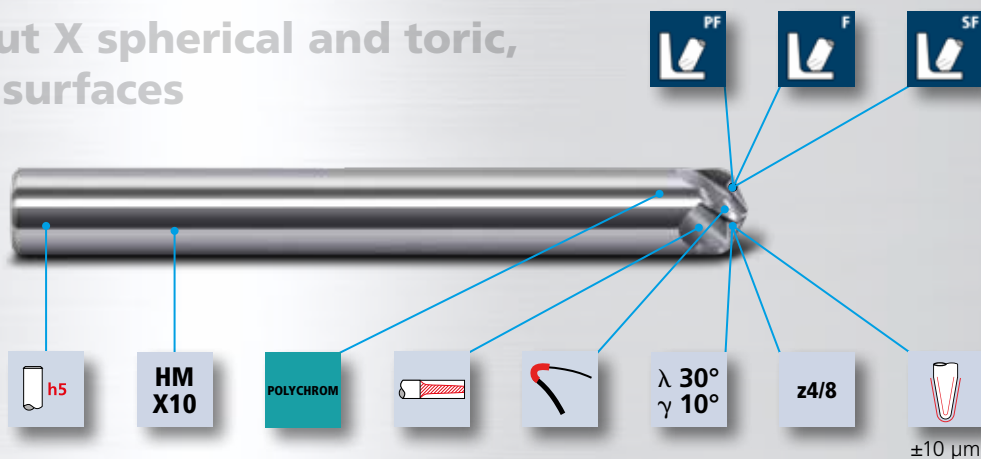
The FRAISA application engineers will be happy to advise you.

For further information, please refer to fraisa.com

ArCut X **spherical** and **toric** for finishing of flat surfaces

The technologies of ArCut X spherical and toric, flat surfaces

ArCut X spherical and toric, flat surfaces



A detailed description of each technology can be found on page 7 and an overview of the application suitability of each technology on page 9.

An overview of applications of ArCut X spherical and toric, flat surfaces



Pre-Finishing (PF): flat surfaces

- Pre-finishing the bottoms (flat & free-form surfaces) with the circular arc radius (curved surface area)
- Machining with an ArCut X cutter (spherical & toric) with a conical angle greater than 50°
- Machining is performed by means of roll cutting parallel to the face of the workpiece



Finishing (F): flat surfaces

- Finishing the bottoms (flat & free-form surfaces) with the circular arc radius (curved surface area)
- Machining with an ArCut X cutter (spherical & toric) with a conical angle greater than 50°
- Machining is performed by means of roll cutting parallel to the face of the workpiece



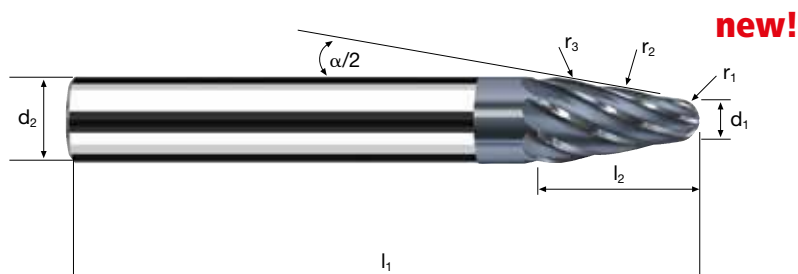
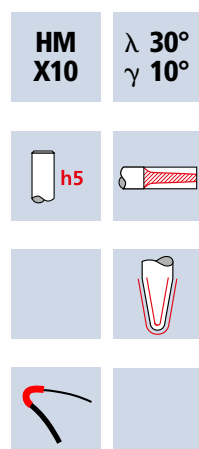
Super-Finishing (SF): flat surfaces

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Spherical, form tolerance ± 0.01









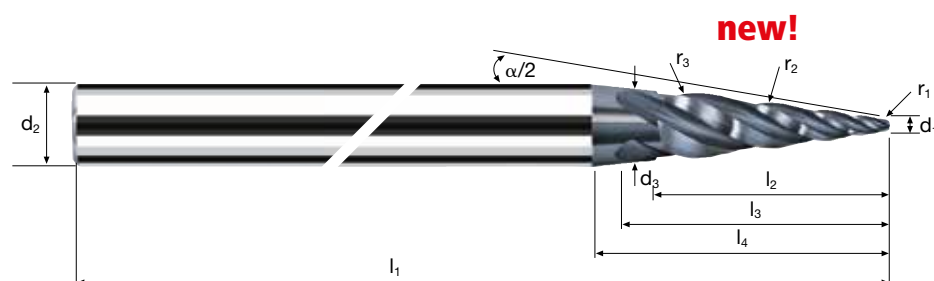
Rm ≤ 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium
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[illegible]

Spherical, form tolerance ± 0.005



<p>HM X10</p>	<p>λ 30° γ 10°</p>
	
	
	



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium
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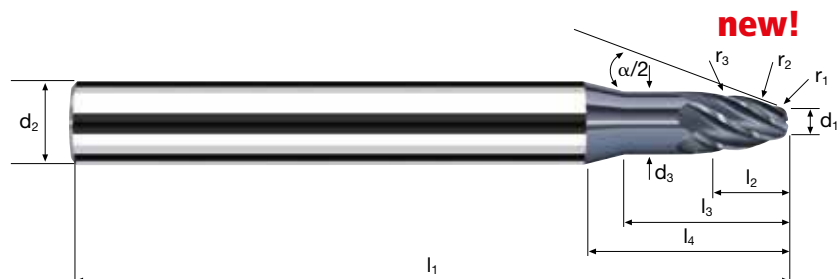
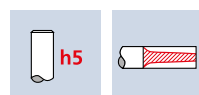
Circular arc milling cutter ArCut X

Toric, form tolerance ± 0.010



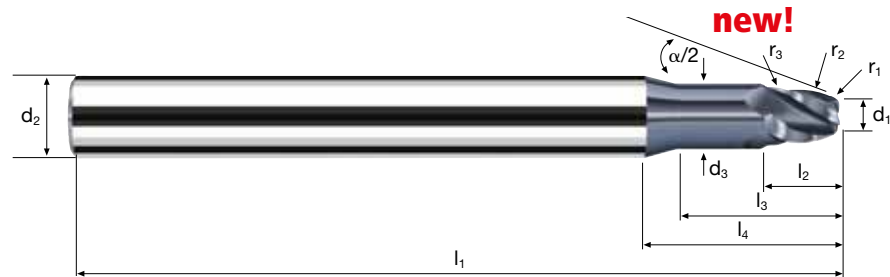
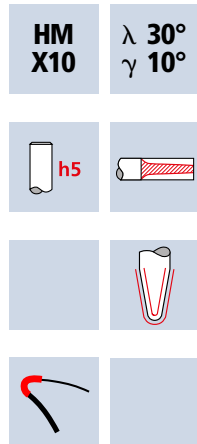
HM
X10

λ **30°**
 γ **10°**



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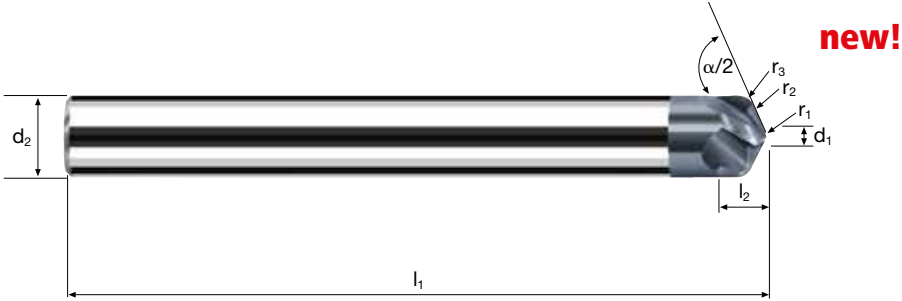
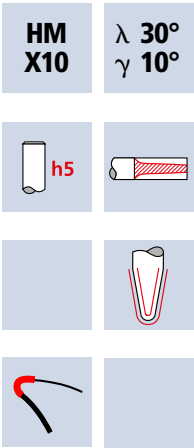


Rm ≤ 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium
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[illegible]

Circular arc milling cutter ArCut X

Flat surfaces, form tolerance ± 0.010



Rm < 850	Rm 850-1100	Rm 1100-1300	Rm 1300-1500	HRC 48-56			Inox Stainless	Ti Titanium	GG(G) Tool Steel Aluminium
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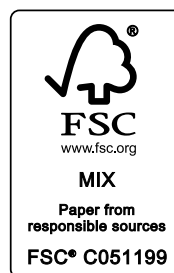
												POLYCHROM
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											8550	P8550
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140	2	65°	10	84	5.0	1	250	1.75	4	●	●	
300	6	70°	20	104	5.5	1	250	1.00	8	●	●	
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FRAISA SA

Gurzelenstr. 7 | CH-4512 Bellach |
Tel.: +41 (0) 32 617 42 42 | Fax: +41 (0) 32 617 42 41 |
mail.ch@fraisa.com | **fraisa.com** |

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