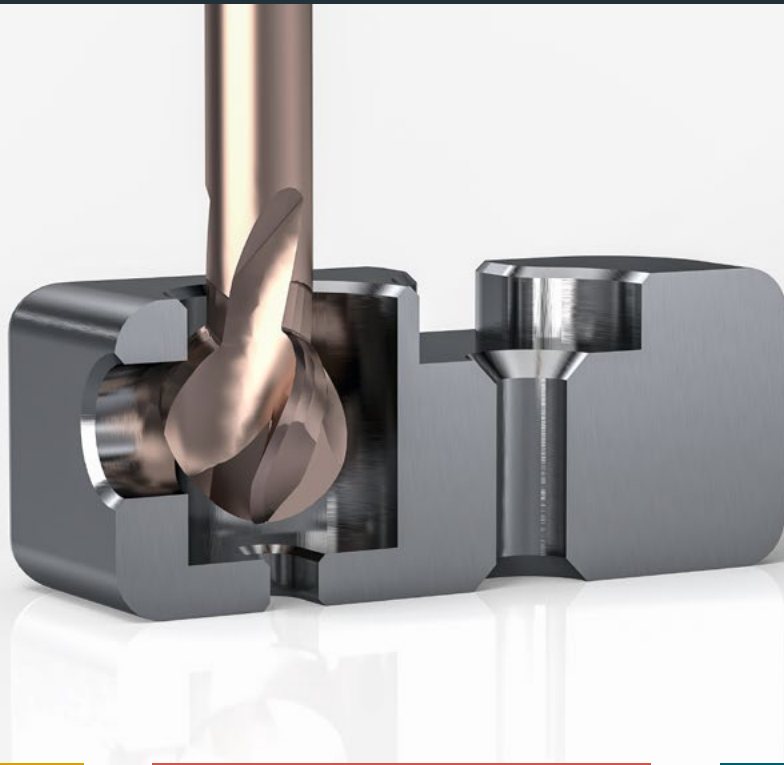
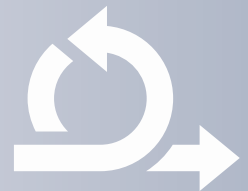


DEBURRING

HBmicrotec[®]
ACTIONTOOLS & ENGINEERING

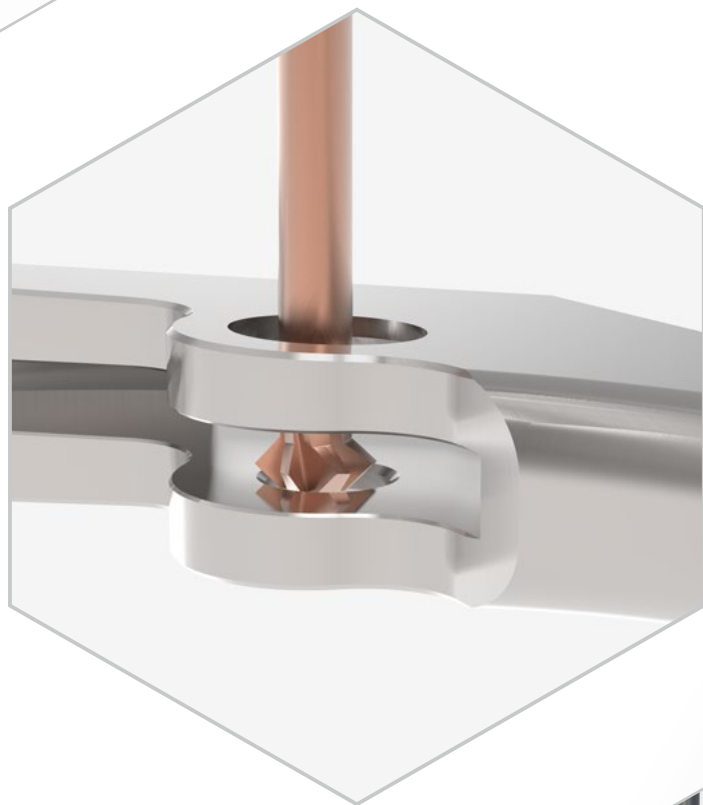


ACTIONMILL[®]
by HB microtec



TARGETMILL[®]
by HB microtec





HB microtec® offers a complete deburring mill program with the ACTIONMILL® Chamfer and TARGET-MILL® Chamfer. Our deburring mill range is perfectly coordinated and provides the ideal deburring tool for every operation.

For example, when edge breaking, valuable production time can be saved with the ACTIONMILL Lollipop® by performing complete deburring directly on the machine.



Material application areas

Titanium alloys, CoCr alloys, stainless steel alloys (INOX), steel alloys, zirconium, PMMA, PEEK, wax, aluminum alloys, brass alloys

Quality

- Finely ground flutes
- Sharp, positive geometries
- Very smooth, droplet-free coatings
- Microhardness of up to 7000 HV
- Micro tools and micro geometries with high form accuracy
- Fine-grain solid carbide materials with high fracture toughness and thermal shock resistance
- Strategy support with SolidCAM

The HB microtec® solid carbide deburring tools can be run at extremely high feed rates; thanks to the very good surface quality combined with sharp cutting edges and first-class geometries, users benefit from long tool life.

Custom made deburring tools

On request, HB microtec® also designs custom-ground special deburring shapes. Different diameters, lengths, shapes and numbers of cutting edges can be adapted to your needs.

Use our template for the individual design of your solid carbide deburring tool.

Service

Complete machining technology from a single source:

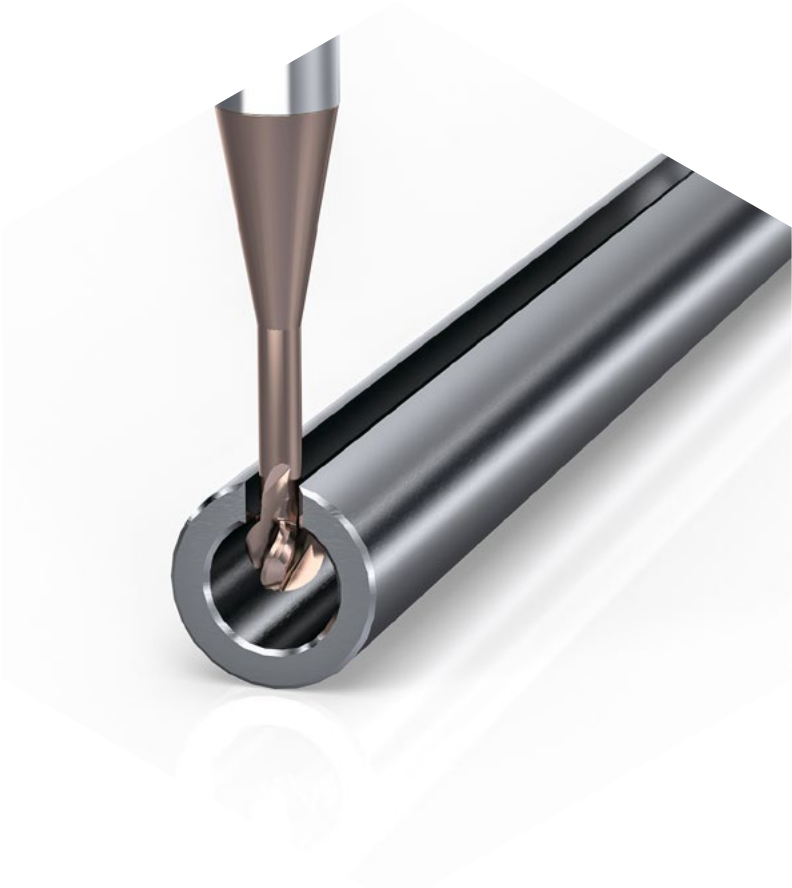
- Cutting tools – development and manufacturing
- Regrinding of your cutting tools
- Delivery and pick-up service
- 7-10 day express service
- Contract grinding of your medical technology products
- Project planning of machining processes
- CAM programming

We will gladly support you in application engineering and in creating NC deburring programs with the CAM system SolidCAM.

	Product	Rm [N/mm²]	Page
		up to 1570	12
		up to 1570	14
		up to 1570	20
		up to 1570	22
		up to 1570	26
		up to 1570	30
		up to 1570	34
		up to 1570	38
	ACTIONMILL Special-Tool		44



	Description	Page
	Setting gauges by HB microtec	53
	About HB microtec	55
	Regrinding service	56
	Services	58
	Icon legend	60



Standard deburring tools

ACTIONMILL INOX-Lollipop

Ø 0.8 - Ø 10.0



Overview:

- High-performance Lollipop mill from Ø 0.8 mm to Ø 10 mm
- Deburring of demanding and complex contours using ball-shaped cutting edges
- 3 cutting edges cutting over 305° of the ball
- For INOX (stainless steel), titanium G3 to G5; steel and cast iron
- Deburring, chamfering or line milling with one tool

Page 12

ACTIONMILL TITAN-Lollipop

Ø 0.8 - Ø 10.0



Overview:

- High-performance Lollipop mill from Ø 0.8 mm to Ø 10 mm
- Deburring of demanding and complex contours using ball-shaped cutting edges
- 3 cutting edges cutting over 305° of the ball
- For TITANIUM G1 & G2; aluminum, plastics, brass
- Deburring, chamfering or line milling with one tool

Page 14

ACTIONMILL Quarter-Chamfer Z2

R 0.2 - R 3.0



Overview:

- Quarter-circle mill from R 0.2 mm to R 3.0 mm
- Small inside diameters for precision engineering
- Mill radii directly – no more line milling required
- Thanks to the 4°-6° taper at both ends, no secondary burrs are formed
- 2 flutes ensure sufficient chip space

Page 20

ACTIONMILL Quarter-Chamfer Z3

R 0.2 - R 3.0



Overview:

- Quarter-circle mill from R 0.2 mm to R 3.0 mm
- Small inside diameters for precision engineering
- Mill radii directly – no more line milling required
- Thanks to the 4°-6° taper at both ends, no secondary burrs are formed
- 3 flutes ensure excellent surface quality

Page 22

Standard deburring tools

ACTIONMILL INOX-Front-Chamfer

Ø 0.5 - Ø 8.0



Overview:

- 90° mill for chamfering and deburring from Ø 0.5 mm to Ø 8.0 mm
- Deburring edges, grooves, holes, and threads
- No secondary burrs form
- Universally usable in a wide variety of materials
- 4 to 6 flutes ensure excellent surface qualities

Page 26

ACTIONMILL Back-Chamfer

Ø 0.36 - Ø 0.57



Overview:

- "Micro" deburrer from Ø 0.36 mm to Ø 5.7 mm
- Back deburrer for holes from Ø 0.5 mm
- No secondary burrs form
- Universally usable in a wide variety of materials
- 3 to 6 cutting edges ensure excellent surface quality

Page 30

ACTIONMILL Double-Chamfer

Ø 1.8 - Ø 6.0



Overview:

- 90° forward & backward deburrer from Ø 1.8 mm to Ø 6.0 mm
- No secondary burrs form
- Universally usable in a wide variety of materials
- 3 to 4 flutes ensure excellent surface quality

Page 34

TARGETMILL Double-Chamfer

Ø 1.8 - Ø 6.0



Overview:

- 90° forward & backward deburrer from Ø 1.8 mm to Ø 6.0 mm
- No secondary burrs form
- Universally usable in a wide variety of materials
- 3 to 4 flutes ensure excellent surface quality

Page 38

Special tools



Overview:

- Special deburring tools
- Combination tools
- Form tools
- Custom-ground & individualized tools

Page 42

HB microtec - Setting gauges available in various sizes



Overview:

The gauges are used to ensure repeatable clamping lengths on CNC machines during tool change or setup.

Page 51

Custom-ground special tools



■ Deburring drills

Drilling + chamfering + back chamfering



■ Form reamers

Step reaming + face reaming + outer chamfering



■ Double quarter-circle mill

Forward and backward deburrer
for round edges

Program description

Specialization

With the ACTIONMILL® and TARGETMILL® Chamfer, HB microtec offers a complete deburring and engraving tool program. The standardized tools are specialized in chamfering, deburring and engraving in the diameter range from 0.1 mm to 10 mm.

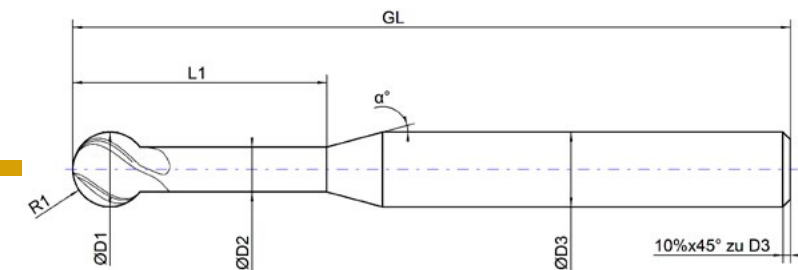
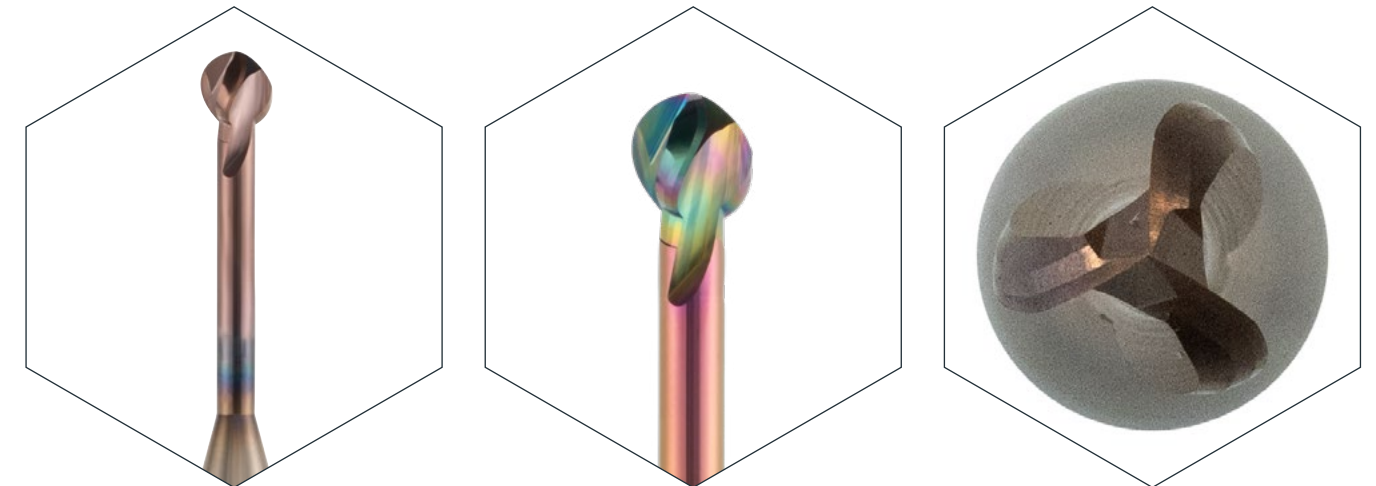
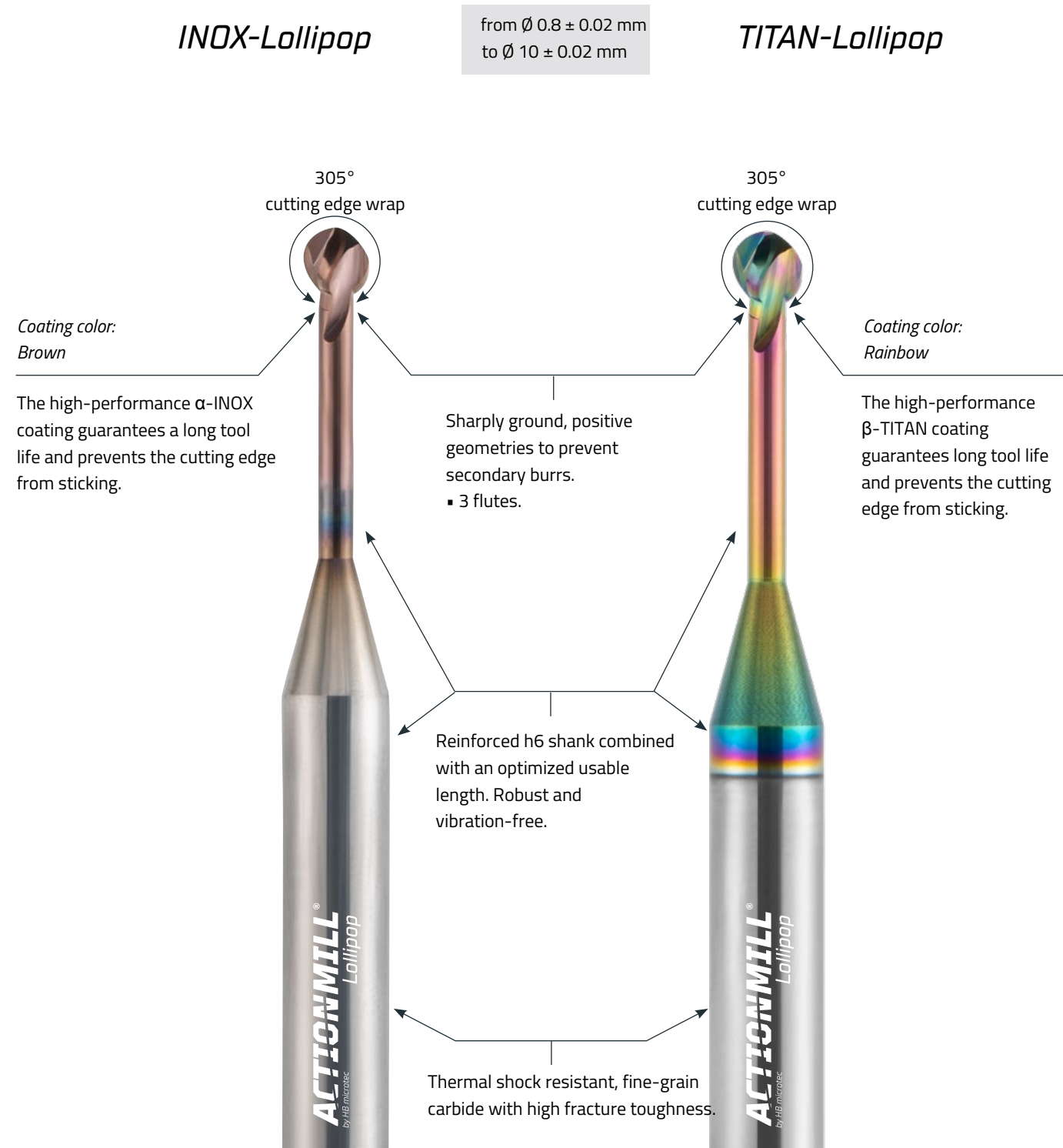
Materials

With these different, perfectly complementary tools, users get the ideal solution for every engraving and deburring operation. The deburring tools can be used universally, e.g. in stainless steel, steel, titanium, cast iron or non-ferrous metals.

Manufacturing

The mills owe their essential quality features not only to passionate manufacturing, but also to the carbide grades used, with high fracture toughness and ultra-fine grain. The thin coatings ensure that, on the one hand, sharpness is retained and, on the other hand, the sliding properties are improved.

This promotes very high feed rates and achieves exceptionally good surface quality and tool life.



☐ Inquiry

☐ Order

Order number: _____

Other: _____

Dimensions:

D₁: _____ GL: _____ R₁: _____

D₂: _____ L₁: _____ α: _____

D₃: _____ Z: _____

Coating:

☐ Coated*: _____

☐ Uncoated

Cooling channels:

☐ No ☐ Yes

Cutting direction:

☐ Right ☐ Left

Material to be machined:

Shank shape:

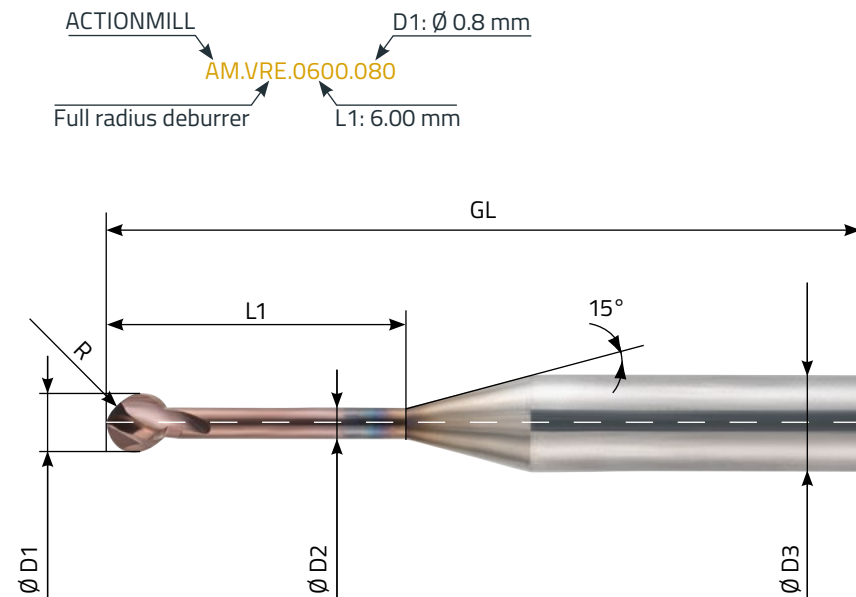
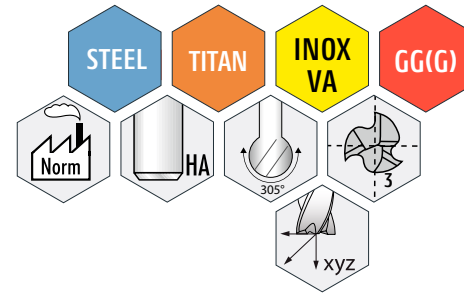
Quantity:

Date, signature & company stamp

Contact person:

* Without further information, the most suitable coating will be used.

INOX-Lollipop



5 PRO's of the ACTIONMILL:

- High-performance mill Lollipop from Ø 0.8 mm to Ø 10.0 mm
- Milling of demanding and complex contours
using the 305° cutting edges
- No secondary burrs thanks to the 3 flutes
- For INOX (stainless steel), titanium G3 to G5, steel and cast iron
- Deburring, chamfering or line milling with one tool

Article number	Coating	Flutes	D1 (mm)	D1 (inch)	R (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	GL (mm)
AM.VRE.0600.080	α-INOX	3	Ø 0.800	-	0.4000	0.40	4.00	6.00	50.00
AM.VRE.0600.100	α-INOX	3	Ø 1.000	-	0.5000	0.50	4.00	6.00	50.00
AM.VRE.0800.120	α-INOX	3	Ø 1.200	-	0.6000	0.60	4.00	8.00	50.00
AM.VRE.0800.150	α-INOX	3	Ø 1.500	-	0.7500	0.75	4.00	8.00	50.00
AM.VRE.0800.1587	α-INOX	3	Ø 1.587	1 / 16"	0.7935	0.79	4.00	8.00	60.00
AM.VRE.1000.180	α-INOX	3	Ø 1.800	-	0.9000	0.90	4.00	10.00	60.00
AM.VRE.1000.200	α-INOX	3	Ø 2.000	-	1.0000	1.00	4.00	10.00	60.00
AM.VRE.1100.220	α-INOX	3	Ø 2.200	-	1.1000	1.10	4.00	11.00	60.00
AM.VRE.1100.2381	α-INOX	3	Ø 2.381	3 / 32"	1.1905	1.19	4.00	11.00	60.00
AM.VRE.1200.250	α-INOX	3	Ø 2.500	-	1.2500	1.25	4.00	12.00	60.00
AM.VRE.1400.280	α-INOX	3	Ø 2.800	-	1.4000	1.40	4.00	14.00	60.00
AM.VRE.1400.300	α-INOX	3	Ø 3.000	-	1.5000	1.50	4.00	14.00	60.00
AM.VRE.1600.3175	α-INOX	3	Ø 3.175	1 / 8"	1.5875	1.59	4.00	16.00	60.00
AM.VRE.1800.350	α-INOX	3	Ø 3.500	-	1.7500	1.75	6.00	18.00	70.00
AM.VRE.1800.380	α-INOX	3	Ø 3.800	-	1.9000	1.90	6.00	18.00	70.00
AM.VRE.1800.3968	α-INOX	3	Ø 3.968	5 / 32"	1.9840	1.99	6.00	18.00	70.00
AM.VRE.1800.400	α-INOX	3	Ø 4.000	-	2.0000	2.00	6.00	18.00	70.00
AM.VRE.1800.420	α-INOX	3	Ø 4.200	-	2.1000	2.10	6.00	18.00	70.00
AM.VRE.2400.450	α-INOX	3	Ø 4.500	-	2.2500	2.25	6.00	24.00	80.00
AM.VRE.2400.4762	α-INOX	3	Ø 4.762	3 / 16"	2.3810	2.38	6.00	24.00	80.00
AM.VRE.2500.500	α-INOX	3	Ø 5.000	-	2.5000	2.50	6.00	25.00	80.00
AM.VRE.2500.520	α-INOX	3	Ø 5.200	-	2.6000	2.60	6.00	25.00	80.00
AM.VRE.2600.5556	α-INOX	3	Ø 5.556	7 / 32"	2.7780	2.78	6.00	26.00	80.00
AM.VRE.2600.580	α-INOX	3	Ø 5.800	-	2.9000	2.90	8.00	26.00	80.00
AM.VRE.2600.600	α-INOX	3	Ø 6.000	-	3.0000	3.00	8.00	26.00	80.00
AM.VRE.2600.620	α-INOX	3	Ø 6.200	-	3.1000	3.10	8.00	26.00	80.00
AM.VRE.2600.635	α-INOX	3	Ø 6.350	1 / 4"	3.1750	3.18	8.00	26.00	80.00
AM.VRE.2800.680	α-INOX	3	Ø 6.800	-	3.4000	3.40	8.00	28.00	90.00
AM.VRE.2800.700	α-INOX	3	Ø 7.000	-	3.5000	3.50	8.00	28.00	90.00
AM.VRE.2800.800	α-INOX	3	Ø 8.000	-	4.0000	4.00	10.00	28.00	90.00
AM.VRE.3000.900	α-INOX	3	Ø 9.000	-	4.5000	4.50	10.00	30.00	90.00
AM.VRE.3200.1000	α-INOX	3	Ø 10.000	-	5.0000	5.00	12.00	32.00	100.00

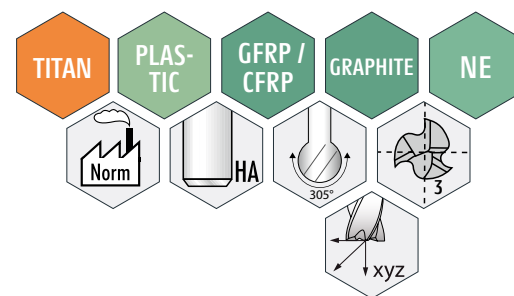
Available from stock

Overview:

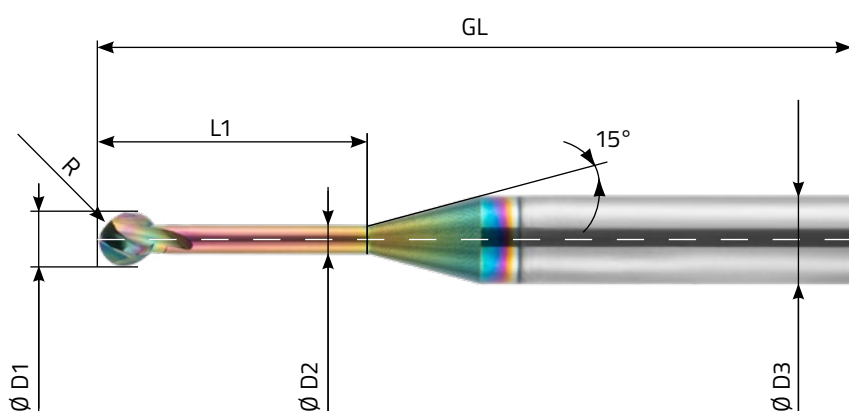
305° ±5° full-wrap cutting edges

The α-INOX coating is very temperature-stable and adhesion-reducing, with a layer thickness of 1.5 ± 0.5 µm and a microhardness of (HV) 3700 + 400, max. operating temperature 1100°C.

TITAN-Lollipop



ACTIONMILL
AM.VRE.0600.080.1 ← Titanium version
Full radius deburrer
D1: Ø 0.8 mm
L1: 6.00 mm



5 PRO's of the ACTIONMILL:

- High-performance mill Lollipop from Ø 0.8 mm to Ø 10.0 mm
- Milling of demanding and complex contours
using the 305° cutting edges
- No secondary burrs thanks to the 3 flutes
- For TITANIUM G1 & G2; aluminum, plastics, brass
- Deburring, chamfering or line milling with one tool

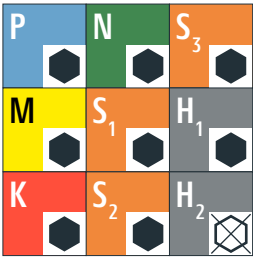
Article number	Coating	Flutes	D1 (mm)	D1 (inch)	R (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	GL (mm)
AM.VRE.0600.080.1	β-Titan	3	Ø 0.800	-	0.4000	0.40	4.00	6.00	50.00
AM.VRE.0600.100.1	β-Titan	3	Ø 1.000	-	0.5000	0.50	4.00	6.00	50.00
AM.VRE.0800.120.1	β-Titan	3	Ø 1.200	-	0.6000	0.60	4.00	8.00	50.00
AM.VRE.0800.150.1	β-Titan	3	Ø 1.500	-	0.7500	0.75	4.00	8.00	50.00
AM.VRE.0800.1587.1	β-Titan	3	Ø 1.587	1 / 16"	0.7935	0.79	4.00	8.00	60.00
AM.VRE.1000.180.1	β-Titan	3	Ø 1.800	-	0.9000	0.90	4.00	10.00	60.00
AM.VRE.1000.200.1	β-Titan	3	Ø 2.000	-	1.0000	1.00	4.00	10.00	60.00
AM.VRE.1100.220.1	β-Titan	3	Ø 2.200	-	1.1000	1.10	4.00	11.00	60.00
AM.VRE.1100.2381.1	β-Titan	3	Ø 2.381	3 / 32"	1.1905	1.19	4.00	11.00	60.00
AM.VRE.1200.250.1	β-Titan	3	Ø 2.500	-	1.2500	1.25	4.00	12.00	60.00
AM.VRE.1400.280.1	β-Titan	3	Ø 2.800	-	1.4000	1.40	4.00	14.00	60.00
AM.VRE.1400.300.1	β-Titan	3	Ø 3.000	-	1.5000	1.50	4.00	14.00	60.00
AM.VRE.1600.3175.1	β-Titan	3	Ø 3.175	1 / 8"	1.5875	1.59	4.00	16.00	60.00
AM.VRE.1800.350.1	β-Titan	3	Ø 3.500	-	1.7500	1.75	6.00	18.00	70.00
AM.VRE.1800.380.1	β-Titan	3	Ø 3.800	-	1.9000	1.90	6.00	18.00	70.00
AM.VRE.1800.3968.1	β-Titan	3	Ø 3.968	5 / 32"	1.9840	1.99	6.00	18.00	70.00
AM.VRE.1800.400.1	β-Titan	3	Ø 4.000	-	2.0000	2.00	6.00	18.00	70.00
AM.VRE.1800.420.1	β-Titan	3	Ø 4.200	-	2.1000	2.10	6.00	18.00	70.00
AM.VRE.2400.450.1	β-Titan	3	Ø 4.500	-	2.2500	2.25	6.00	24.00	80.00
AM.VRE.2400.4762.1	β-Titan	3	Ø 4.762	3 / 16"	2.3810	2.38	6.00	24.00	80.00
AM.VRE.2500.500.1	β-Titan	3	Ø 5.000	-	2.5000	2.50	6.00	25.00	80.00
AM.VRE.2500.520.1	β-Titan	3	Ø 5.200	-	2.6000	2.60	6.00	25.00	80.00
AM.VRE.2600.5556.1	β-Titan	3	Ø 5.556	7 / 32"	2.7780	2.78	6.00	26.00	80.00
AM.VRE.2600.580.1	β-Titan	3	Ø 5.800	-	2.9000	2.90	8.00	26.00	80.00
AM.VRE.2600.600.1	β-Titan	3	Ø 6.000	-	3.0000	3.00	8.00	26.00	80.00
AM.VRE.2600.620.1	β-Titan	3	Ø 6.200	-	3.1000	3.10	8.00	26.00	80.00
AM.VRE.2600.635.1	β-Titan	3	Ø 6.350	1 / 4"	3.1750	3.18	8.00	26.00	80.00
AM.VRE.2800.680.1	β-Titan	3	Ø 6.800	-	3.4000	3.40	8.00	28.00	90.00
AM.VRE.2800.700.1	β-Titan	3	Ø 7.000	-	3.5000	3.50	8.00	28.00	90.00
AM.VRE.2800.800.1	β-Titan	3	Ø 8.000	-	4.0000	4.00	10.00	28.00	90.00
AM.VRE.3000.900.1	β-Titan	3	Ø 9.000	-	4.5000	4.50	10.00	30.00	90.00
AM.VRE.3200.1000.1	β-Titan	3	Ø 10.000	-	5.0000	5.00	12.00	32.00	100.00

Available from stock

Overview:

305° ±5° full-wrap cutting edges

The β-TITAN coating is very adhesion-reducing, with a friction coefficient of 0.07 against steel and a layer thickness of 1.5 ± 0.5 µm and a microhardness (HV) 5000 +2000, max. operating temperature 1000°C.



Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
P	Steels up to RM < 1200N/mm ²	1.0044	S275JR	AISI 1020
		1.0715	11SMn30	AISI 1215
		1.7131	16MnCr5	AISI 5115
		1.3505	100Cr6	AISI 52100
		1.7225	42CrMo4	AISI 4140
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C
		1.4542	X5CrNiCuNb 16-4	AISI 630 / ASTM 17-4 PH
		1.4545	X5CrNiCuNb 15-5	ASTM 15-5 PH
		1.4301	X5CrNi 18-10	AISI 304
		1.4435	X2CrNiMo 18-14-3	AISI 316L
K	Cast iron	0.6020	GG20	ASTM 30
		0.6030	GG30	ASTM 40B
		0.7040	GGG40	ASTM 60-40-18
		0.7060	GGG60	ASTM 80-60-03
N	Non-ferrous metals	3.2315	AlMgSi1	ASTM 6351
		2.0065	Cu-ETP / CW004A	UNS C11000
		2.0321	CuZn37 CW508L	UNS C27400
		2.0401	CuZn39Pb3 / CW614N	UNS C38500
		2.0966	CuAl10Ni5Fe4	UNS C63000
S (S1, S2, S3)	Heat-resistant steels, titanium, CrCo	2.4617	NiMo28	Hastelloy B-2
		2.4665	NiCr22Fe18Mo	Hastelloy X
		3.7165	TiAl6V4	ASTM B348 / F136
		9.9367	TiAl6Nb7	ASTM F1295
		2.4964	CoCr20W15Ni	Haynes 25
			CrCoMo28	ASTM F1537
H	Hardened steels ≥ 55 HRC	1.2510	100MnCrMoW4	AISI O1
		1.2379	X153CrMoV12	AISI D2

Recommended use Highly suitable Partially suitable Not recommended

Ø 0.8 mm - Ø 2.0 mm		Ø 2.5 mm - Ø 4.0 mm		Ø 6.0 mm - Ø 10.0 mm	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
100-140	0.02 - 0.035	100-140	0.03 - 0.045	100-140	0.05 - 0.065
100-140	0.02 - 0.03	100-140	0.03 - 0.04	100-140	0.05 - 0.055
80-110	0.02 - 0.03	80-110	0.035 - 0.045	80-110	0.045 - 0.055
70-100	0.015 - 0.025	70-100	0.035 - 0.045	70-100	0.045 - 0.055
80-140	0.02 - 0.04	80-140	0.04 - 0.055	80-140	0.05 - 0.065
80-160	0.02 - 0.04	80-160	0.035 - 0.06	80-160	0.055 - 0.06
80-140	0.02 - 0.045	80-140	0.035 - 0.06	80-140	0.055 - 0.06
80-120	0.02 - 0.045	80-120	0.035 - 0.06	80-120	0.055 - 0.06
50 - 80	0.02 - 0.03	50 - 80	0.03 - 0.04	50 - 80	0.03 - 0.05
50-80	0.02 - 0.03	50-80	0.03 - 0.04	50-80	0.03 - 0.05
50-80	0.02 - 0.03	50-80	0.03 - 0.04	50-80	0.03 - 0.05
no data available					
no data available					

INOX quarter-circle mill

from $R\ 0.2 \pm 0.01\text{ mm}$
to $R\ 3.0 \pm 0.01\text{ mm}$

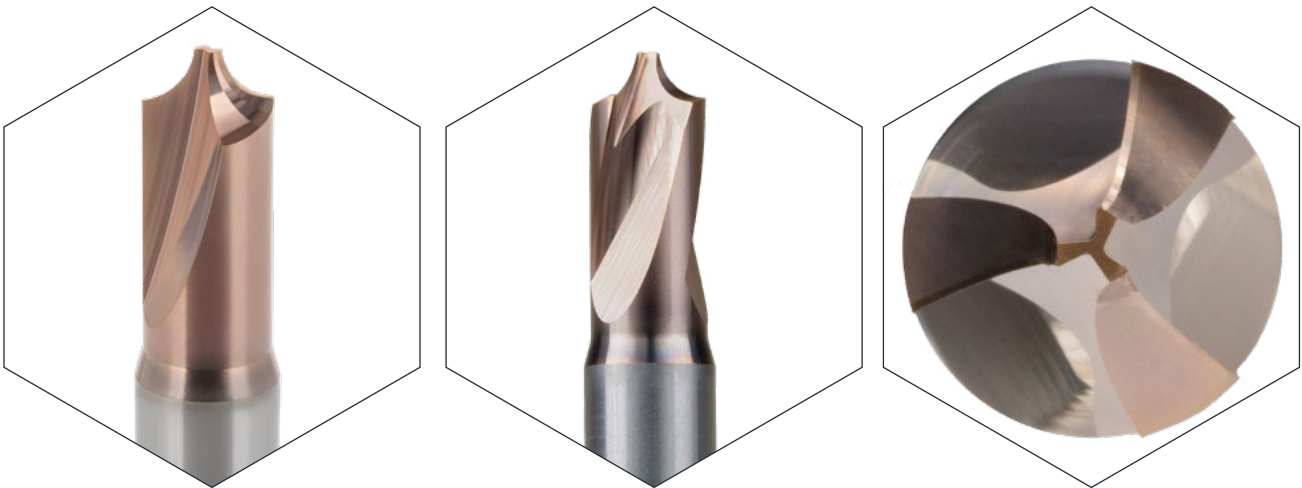
The high-performance α -INOX coating guarantees a long tool life and prevents the cutting edge from sticking.
▪ 2 flutes

Sharply ground, positive geometries to prevent secondary burrs.

The high-performance α -INOX coating guarantees a long tool life and prevents the cutting edge from sticking.
▪ 3 flutes

Reinforced h6 shank, combined with an optimized usable length. Robust and vibration-free.

Thermal shock resistant, fine-grain carbide with high fracture toughness.



☐ Inquiry

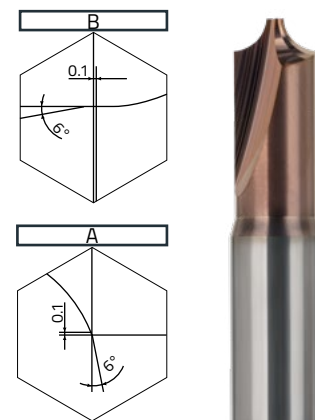
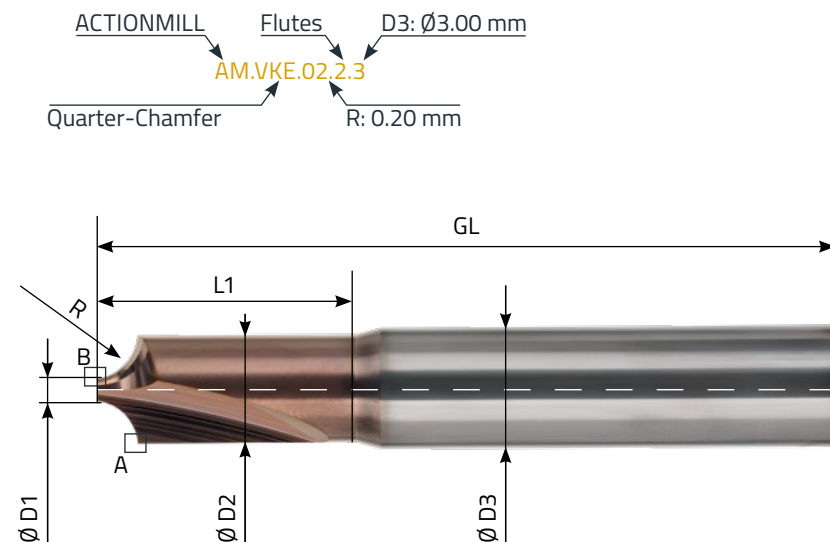
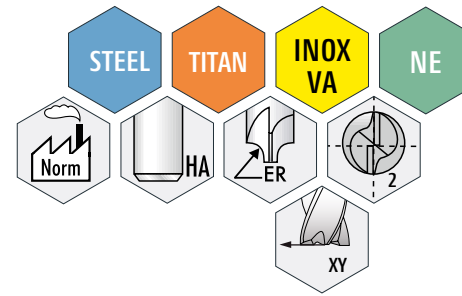
☐ Order

Order number: _____ Other: _____

Dimensions: D ₁ : _____ GL: _____ Z: _____ D ₂ : _____ L ₁ : _____ α : _____ D ₃ : _____ L ₂ : _____ R ₁ : _____	Coating: ☐ Coated*: _____ ☐ Uncoated	Cooling channels: ☐ No ☐ Yes Cutting direction: ☐ Right ☐ Left
Material to be machined: _____	Shank shape: _____	Quantity: _____
Date, signature & company stamp: _____		Contact person: _____

* Without further information, the most suitable coating will be used.

INOX-Quarter-Chamfer Z2



5 PRO's of the ACTIONMILL:

- INOX quarter circle milling cutters from R 0.2 mm to R 3.0 mm
- Mill radii directly – no more line milling required
- Thanks to the 4°-6° taper at both ends
no secondary burrs are formed
- Small inside diameters from Ø0.5 for precision engineering
- 2 flutes ensure sufficient chip space

Article number	Coating	Flutes	D1 (mm)	R (mm)	D2 (mm)	D3 (mm)	L1 (mm)	GL (mm)
AM.VKE.02.2.3	α-INOX	2	Ø0.50	0.20	Ø1.00	Ø3.00	4.00	50.00
AM.VKE.03.2.3	α-INOX	2	Ø0.50	0.30	Ø1.25	Ø3.00	4.00	50.00
AM.VKE.04.2.3	α-INOX	2	Ø0.50	0.40	Ø1.40	Ø3.00	5.00	50.00
AM.VKE.05.2.3	α-INOX	2	Ø0.50	0.50	Ø1.60	Ø3.00	6.00	50.00
AM.VKE.10.2.3	α-INOX	2	Ø0.80	1.00	Ø2.80	Ø3.00	8.00	50.00
AM.VKE.15.2.6	α-INOX	2	Ø1.50	1.50	Ø4.40	Ø6.00	12.00	50.00
AM.VKE.20.2.6	α-INOX	2	Ø1.50	2.00	Ø5.30	Ø6.00	14.00	50.00
AM.VKE.25.2.8	α-INOX	2	Ø1.50	2.50	Ø6.20	Ø8.00	16.00	60.00
AM.VKE.30.2.8	α-INOX	2	Ø1.50	3.00	Ø7.10	Ø8.00	17.00	60.00

Available from stock

Overview:

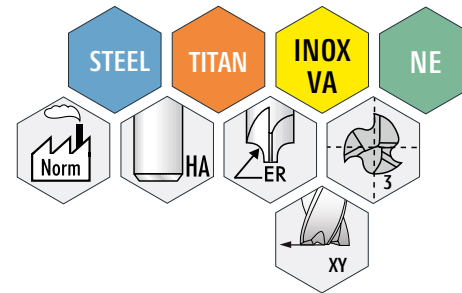
INOX quarter-circle mill Z2 with 4°-6° taper at both ends.

The α-INOX coating is very temperature-stable and adhesion-reducing, with a layer thickness of $1.5 \pm 0.5 \mu\text{m}$ and a microhardness of (HV) $3700 + 400$, max. operating temperature 1100°C .

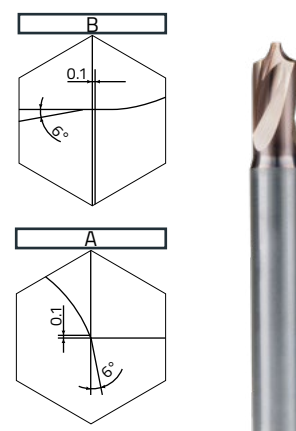
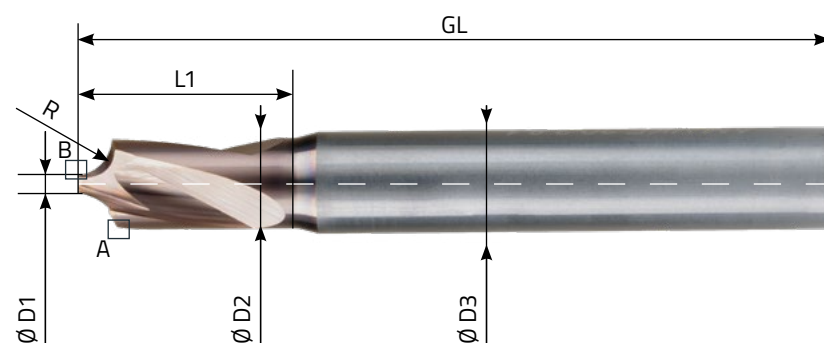
Ideal material application range when machining stainless steel alloys (INOX), CoCr alloys, titanium alloys (G5), steel alloys, cast iron, aluminum alloys and plastic alloys.



INOX-Quarter-Chamfer Z3



ACTIONMILL Flutes D3: Ø3.00 mm
AM.VKE.02.3.3.1
Quarter-Chamfer R: 0.20 mm



5 PRO's of the ACTIONMILL:

- INOX quarter circle milling cutters from R 0.2 mm to R 3.0 mm
- Mill radii directly – no more line milling required
- Thanks to the 4°-6° taper at both ends
no secondary burrs are formed
- Universally usable in a wide variety of materials
- 3 flutes ensure excellent surface qualities

Article number	Coating	Flutes	D1 (mm)	R (mm)	D2 (mm)	D3 (mm)	L1 (mm)	GL (mm)
AM.VKE.02.3.3.1	α-INOX	3	Ø0.50	0.20	Ø1.00	Ø3.00	4.00	50.00
AM.VKE.03.3.3.1	α-INOX	3	Ø0.50	0.30	Ø1.25	Ø3.00	4.00	50.00
AM.VKE.04.3.3.1	α-INOX	3	Ø0.50	0.40	Ø1.40	Ø3.00	5.00	50.00
AM.VKE.05.3.3.1	α-INOX	3	Ø0.50	0.50	Ø1.60	Ø3.00	6.00	50.00
AM.VKE.10.3.3.1	α-INOX	3	Ø0.80	1.00	Ø2.80	Ø3.00	8.00	50.00
AM.VKE.15.3.6.1	α-INOX	3	Ø1.50	1.50	Ø4.40	Ø6.00	12.00	50.00
AM.VKE.20.3.6.1	α-INOX	3	Ø1.50	2.00	Ø5.30	Ø6.00	14.00	50.00
AM.VKE.25.3.8.1	α-INOX	3	Ø1.50	2.50	Ø6.20	Ø8.00	16.00	60.00
AM.VKE.30.3.8.1	α-INOX	3	Ø1.50	3.00	Ø7.10	Ø8.00	17.00	60.00

Available from stock

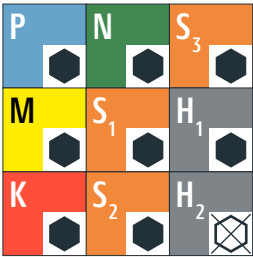
Overview:

INOX quarter-circle mill Z3 with 4°-6° taper at both ends.

The α-INOX coating is very temperature-stable and adhesion-reducing, with a layer thickness of $1.5 \pm 0.5 \mu\text{m}$ and a microhardness of (HV) $3700 + 400$, max. operating temperature 1100°C .

Ideal material application range when machining stainless steel alloys (INOX), CoCr alloys, titanium alloys (G5), steel alloys, cast iron, aluminum alloys and plastic alloys.



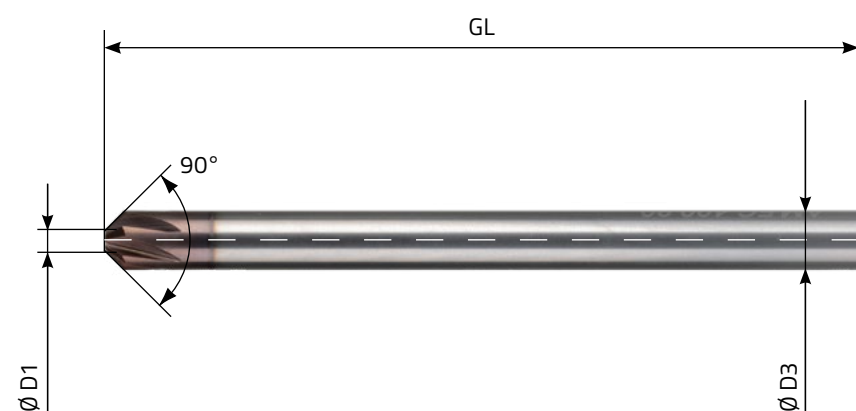
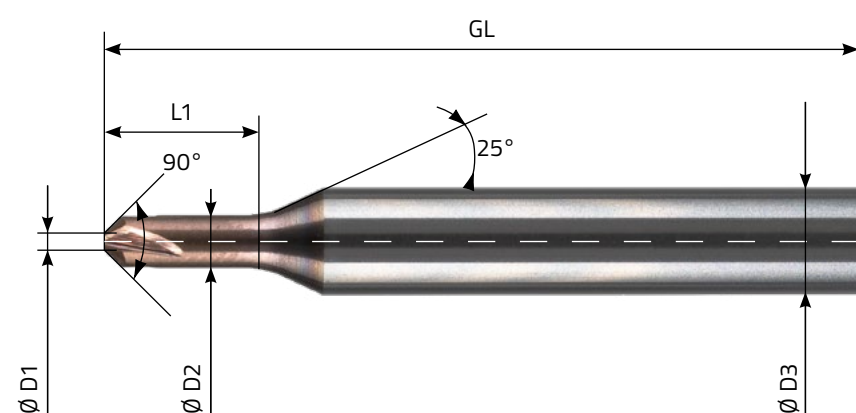
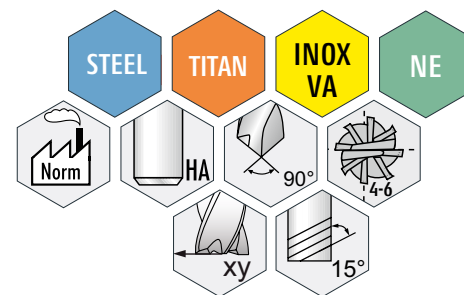


Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
P	Steels up to RM < 1200N/mm ²	1.0044	S275JR	AISI 1020
		1.0715	11SMn30	AISI 1215
		1.7131	16MnCr5	AISI 5115
		1.3505	100Cr6	AISI 52100
		1.7225	42CrMo4	AISI 4140
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C
		1.4542	X5CrNiCuNb 16-4	AISI 630 / ASTM 17-4 PH
		1.4545	X5CrNiCuNb 15-5	ASTM 15-5 PH
		1.4301	X5CrNi 18-10	AISI 304
		1.4435	X2CrNiMo 18-14-3	AISI 316L
K	Cast iron	0.6020	GG20	ASTM 30
		0.6030	GG30	ASTM 40B
		0.7040	GGG40	ASTM 60-40-18
		0.7060	GGG60	ASTM 80-60-03
N	Non-ferrous metals	3.2315	AlMgSi1	ASTM 6351
		2.0065	Cu-ETP / CW004A	UNS C11000
		2.0321	CuZn37 CW508L	UNS C27400
		2.0401	CuZn39Pb3 / CW614N	UNS C38500
		2.0966	CuAl10Ni5Fe4	UNS C63000
S (S1, S2, S3)	Heat-resistant steels, titanium, CrCo	2.4617	NiMo28	Hastelloy B-2
		2.4665	NiCr22Fe18Mo	Hastelloy X
		3.7165	TiAl6V4	ASTM B348 / F136
		9.9367	TiAl6Nb7	ASTM F1295
		2.4964	CoCr20W15Ni	Haynes 25
H	Hardened steels ≥ 55 HRC		CrCoMo28	ASTM F1537
		1.2510	100MnCrMoW4	AISI O1
		1.2379	X153CrMoV12	AISI D2

Recommended use Highly suitable Partially suitable Not recommended

R0.2 - R1.0 mm		R1.0 -R2 mm		R2.0 - R3.0 mm	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
100-140	0.02 - 0.035	100-140	0.03 - 0.045	100-140	0.05 - 0.065
100-140	0.02 - 0.03	100-140	0.03 - 0.04	100-140	0.05 - 0.055
80-110	0.02 - 0.03	80-110	0.035 - 0.045	80-110	0.045 - 0.055
70-100	0.015 - 0.025	70-100	0.035 - 0.045	70-100	0.045 - 0.055
80-140	0.02 - 0.04	80-140	0.04 - 0.055	80-140	0.05 - 0.065
80-160	0.02 - 0.04	80-160	0.035 - 0.06	80-160	0.055 - 0.06
80-140	0.02 - 0.045	80-140	0.035 - 0.06	80-140	0.055 - 0.06
80-120	0.02 - 0.045	80-120	0.035 - 0.06	80-120	0.055 - 0.06
50 - 80	0.02 - 0.03	50 - 80	0.03 - 0.04	50 - 80	0.03 - 0.05
50-80	0.02 - 0.03	50-80	0.03 - 0.04	50-80	0.03 - 0.05
50-80	0.02 - 0.03	50-80	0.03 - 0.04	50-80	0.03 - 0.05
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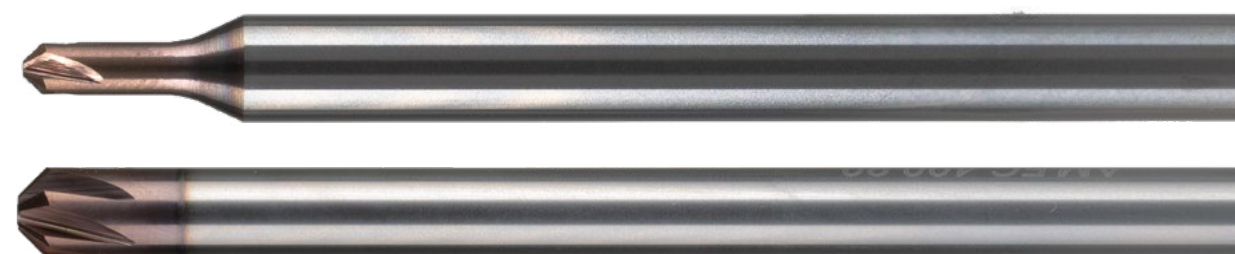
INOX-Front-Chamfer



Shank version available in short and long;

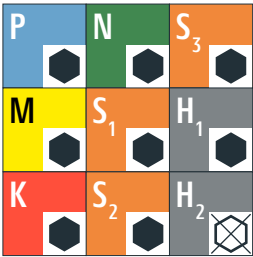
Article number	Coating	Flutes	D1 (mm)	D2 (mm)	D3 (mm)	L1 (mm)	GL (mm)
AM.FC.050.90	α-INOX	4	0.20	0.50	4.00	3.00	55.00
AM.FC.050.90.XL	α-INOX	4	0.20	0.50	4.00	6.00	70.00
AM.FC.100.90	α-INOX	4	0.30	1.00	4.00	3.00	55.00
AM.FC.100.90.XL	α-INOX	4	0.30	1.00	4.00	6.00	70.00
AM.FC.200.90	α-INOX	4	0.60	2.00	4.00	6.00	55.00
AM.FC.200.90.XL	α-INOX	4	0.60	2.00	4.00	9.00	80.00
AM.FC.300.90	α-INOX	5	1.00	3.00	4.00	9.00	55.00
AM.FC.300.90.XL	α-INOX	5	1.00	3.00	4.00	12.00	80.00
AM.FC.400.90	α-INOX	6	1.50	4.00	4.00	-	55.00
AM.FC.400.90.XL	α-INOX	6	1.50	4.00	4.00	-	80.00
AM.FC.600.90	α-INOX	6	2.00	6.00	6.00	-	57.00
AM.FC.600.90.XL	α-INOX	6	2.00	6.00	6.00	-	100.00
AM.FC.800.90	α-INOX	6	2.50	8.00	8.00	-	58.00
AM.FC.800.90.XL	α-INOX	6	2.50	8.00	8.00	-	101.00

Available from stock



5 PRO's of the ACTIONMILL:

- "Micro" front deburrer from Ø 0.5 mm to Ø 8.0 mm
- Deburring and chamfering of edges, grooves, holes and threads
- Reinforced model for long service life
- Universally usable in a wide variety of materials
- 4 to 6 flutes ensure excellent surface qualities

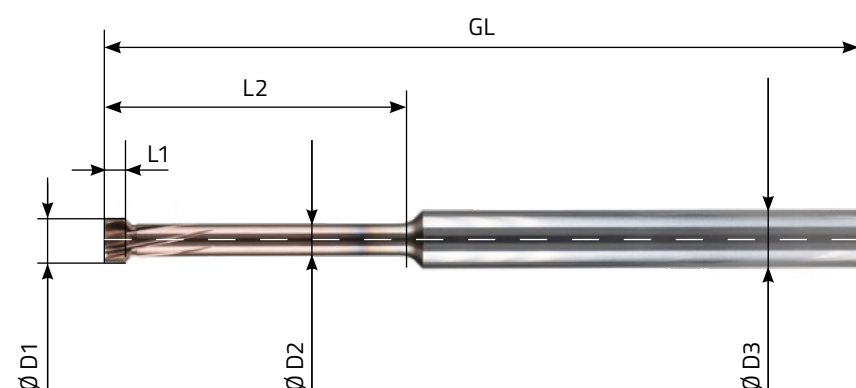
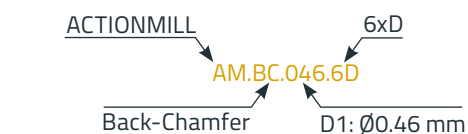
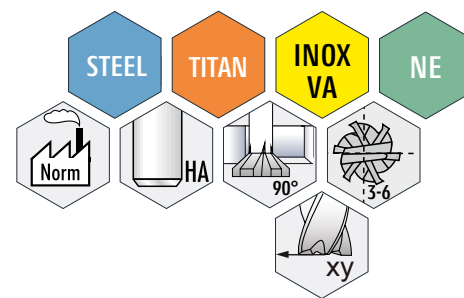


Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
P	Steels up to RM < 1200N/mm ²	1.0044	S275JR	AISI 1020
		1.0715	11SMn30	AISI 1215
		1.7131	16MnCr5	AISI 5115
		1.3505	100Cr6	AISI 52100
		1.7225	42CrMo4	AISI 4140
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C
		1.4542	X5CrNiCuNb 16-4	AISI 630 / ASTM 17-4 PH
		1.4545	X5CrNiCuNb 15-5	ASTM 15-5 PH
		1.4301	X5CrNi 18-10	AISI 304
		1.4435	X2CrNiMo 18-14-3	AISI 316L
K	Cast iron	0.6020	GG20	ASTM 30
		0.6030	GG30	ASTM 40B
		0.7040	GGG40	ASTM 60-40-18
		0.7060	GGG60	ASTM 80-60-03
N	Non-ferrous metals	3.2315	AlMgSi1	ASTM 6351
		2.0065	Cu-ETP / CW004A	UNS C11000
		2.0321	CuZn37 CW508L	UNS C27400
		2.0401	CuZn39Pb3 / CW614N	UNS C38500
		2.0966	CuAl10Ni5Fe4	UNS C63000
S (S1, S2, S3)	Heat-resistant steels, titanium, CrCo	2.4617	NiMo28	Hastelloy B-2
		2.4665	NiCr22Fe18Mo	Hastelloy X
		3.7165	TiAl6V4	ASTM B348 / F136
		9.9367	TiAl6Nb7	ASTM F1295
		2.4964	CoCr20W15Ni	Haynes 25
			CrCoMo28	ASTM F1537
H	Hardened steels ≥ 55 HRC	1.2510	100MnCrMoW4	AISI O1
		1.2379	X153CrMoV12	AISI D2

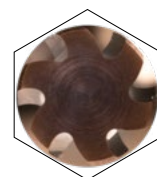
Recommended use Highly suitable Partially suitable Not recommended

Ø 0.5 mm - Ø 2.0 mm		Ø 2.0 mm - Ø 6.0 mm		Ø 6.0 mm - Ø 8.0 mm	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
100-140	0.02 - 0.035	100-140	0.02 - 0.045	100-140	0.05 - 0.065
100-140	0.02 - 0.03	100-140	0.02 - 0.04	100-140	0.05 - 0.055
80-110	0.01 - 0.03	80-110	0.015 - 0.045	80-110	0.045 - 0.055
70-100	0.01 - 0.025	70-100	0.015 - 0.045	70-100	0.045 - 0.055
80-140	0.01 - 0.04	80-140	0.02 - 0.055	80-140	0.05 - 0.065
80-160	0.02 - 0.04	80-160	0.035 - 0.06	80-160	0.055 - 0.06
80-140	0.02 - 0.045	80-140	0.035 - 0.06	80-140	0.055 - 0.06
80-120	0.02 - 0.045	80-120	0.035 - 0.06	80-120	0.055 - 0.06
50 - 80	0.008 - 0.015	50 - 80	0.015 - 0.04	50 - 80	0.03 - 0.05
50-80	0.008 - 0.015	50-80	0.015 - 0.04	50-80	0.03 - 0.05
50-80	0.008 - 0.015	50-80	0.015 - 0.04	50-80	0.03 - 0.05
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no data available					

Back-Chamfer



■ α-INOX coated



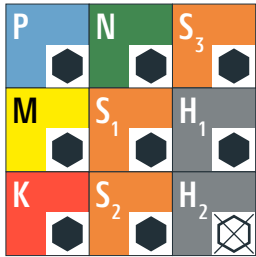
5 PRO's of the ACTIONMILL:

- "Micro" deburrer from Ø 0.36 mm to Ø 5.7 mm
- Back deburrer for bores from Ø 0.4 mm
- No secondary burrs form
- Universally usable in a wide variety of materials
- 3 to 6 cutting edges ensure excellent surface quality

Article number	D1 (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	L2 (mm)	GL (mm)	Flutes
AM.BC.036.4D	Ø0.36	Ø0.22	Ø3.00	0.20	2.00	50.00	3
AM.BC.036.6D	Ø0.36	Ø0.22	Ø3.00	0.20	3.00	50.00	3
AM.BC.046.4D	Ø0.46	Ø0.30	Ø3.00	0.25	2.50	50.00	3
AM.BC.046.6D	Ø0.46	Ø0.30	Ø3.00	0.25	3.75	50.00	3
AM.BC.065.4D	Ø0.65	Ø0.40	Ø3.00	0.35	3.50	50.00	4
AM.BC.065.6D	Ø0.65	Ø0.40	Ø3.00	0.35	5.25	50.00	4
AM.BC.090.4D	Ø0.90	Ø0.60	Ø4.00	0.50	5.00	60.00	5
AM.BC.090.6D	Ø0.90	Ø0.60	Ø4.00	0.50	7.50	60.00	5
AM.BC.140.4D	Ø1.40	Ø0.95	Ø4.00	0.90	7.50	60.00	5
AM.BC.140.6D	Ø1.40	Ø0.95	Ø4.00	0.90	11.25	60.00	5
AM.BC.190.4D	Ø1.90	Ø1.40	Ø4.00	1.00	10.00	70.00	5
AM.BC.190.6D	Ø1.90	Ø1.40	Ø4.00	1.00	15.00	70.00	5
AM.BC.220.4D	Ø2.20	Ø1.60	Ø4.00	1.20	12.50	70.00	5
AM.BC.220.6D	Ø2.20	Ø1.60	Ø4.00	1.20	18.75	70.00	5
AM.BC.290.4D	Ø2.90	Ø2.10	Ø4.00	1.50	15.00	80.00	5
AM.BC.290.6D	Ø2.90	Ø2.10	Ø4.00	1.50	22.65	80.00	5
AM.BC.370.4D	Ø3.70	Ø2.70	Ø4.00	2.00	20.00	80.00	6
AM.BC.370.6D	Ø3.70	Ø2.70	Ø4.00	2.00	30.00	80.00	6
AM.BC.470.4D	Ø4.70	Ø3.30	Ø6.00	2.00	25.00	90.00	6
AM.BC.470.6D	Ø4.70	Ø3.30	Ø6.00	2.00	37.50	90.00	6
AM.BC.570.4D	Ø5.70	Ø4.00	Ø6.00	2.00	30.00	90.00	6
AM.BC.570.6D	Ø5.70	Ø4.00	Ø6.00	2.00	45.00	90.00	6

Available from stock



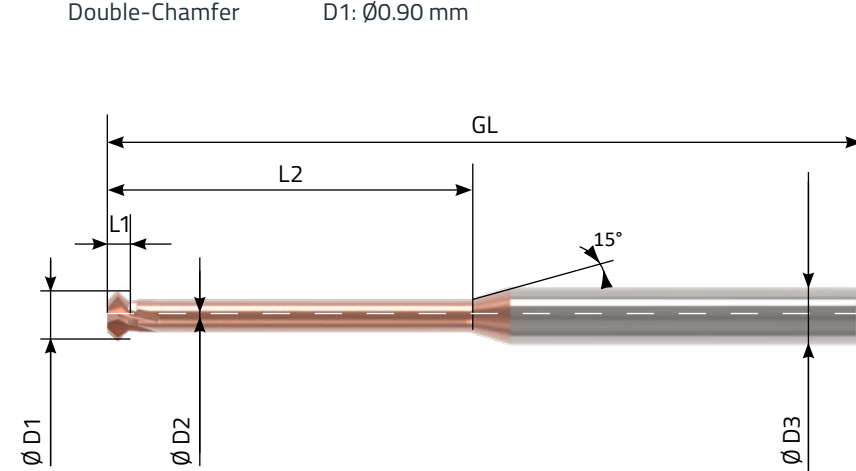
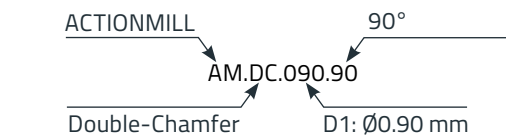
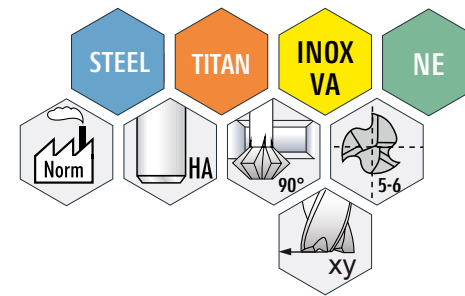


Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
P	Steels up to RM < 1200N/mm ²	1.0044	S275JR	AISI 1020
		1.0715	11SMn30	AISI 1215
		1.7131	16MnCr5	AISI 5115
		1.3505	100Cr6	AISI 52100
		1.7225	42CrMo4	AISI 4140
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C
		1.4542	X5CrNiCuNb 16-4	AISI 630 / ASTM 17-4 PH
		1.4545	X5CrNiCuNb 15-5	ASTM 15-5 PH
		1.4301	X5CrNi 18-10	AISI 304
		1.4435	X2CrNiMo 18-14-3	AISI 316L
K	Cast iron	0.6020	GG20	ASTM 30
		0.6030	GG30	ASTM 40B
		0.7040	GGG40	ASTM 60-40-18
		0.7060	GGG60	ASTM 80-60-03
N	Non-ferrous metals	3.2315	AlMgSi1	ASTM 6351
		2.0065	Cu-ETP / CW004A	UNS C11000
		2.0321	CuZn37 CW508L	UNS C27400
		2.0401	CuZn39Pb3 / CW614N	UNS C38500
		2.0966	CuAl10Ni5Fe4	UNS C63000
S (S1, S2, S3)	Heat-resistant steels, titanium, CrCo	2.4617	NiMo28	Hastelloy B-2
		2.4665	NiCr22Fe18Mo	Hastelloy X
		3.7165	TiAl6V4	ASTM B348 / F136
		9.9367	TiAl6Nb7	ASTM F1295
		2.4964	CoCr20W15Ni	Haynes 25
H	Hardened steels ≥ 55 HRC		CrCoMo28	ASTM F1537
		1.2510	100MnCrMoW4	AISI O1
		1.2379	X153CrMoV12	AISI D2

Recommended use Highly suitable Partially suitable Not recommended

Ø 0.46 mm - Ø 1.4 mm		Ø 2.9 mm - Ø 3.7 mm		Ø 3.7 mm - 4.7 mm	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
100-140	0.02 - 0.035	100-140	0.02 - 0.045	100-140	0.025 - 0.065
100-140	0.02 - 0.03	100-140	0.02 - 0.04	100-140	0.025 - 0.055
80-110	0.01 - 0.03	80-110	0.015 - 0.045	80-110	0.025 - 0.055
70-100	0.01 - 0.025	70-100	0.015 - 0.045	70-100	0.025 - 0.055
80-140	0.01 - 0.04	80-140	0.02 - 0.055	80-140	0.03 - 0.065
80-160	0.02 - 0.04	80-160	0.035 - 0.06	80-160	0.025 - 0.06
80-140	0.02 - 0.045	80-140	0.035 - 0.06	80-140	0.025 - 0.06
80-120	0.02 - 0.045	80-120	0.035 - 0.06	80-120	0.025 - 0.06
50 - 80	0.008 - 0.015	50 - 80	0.015 - 0.04	50 - 80	0.02 - 0.05
50-80	0.008 - 0.015	50-80	0.015 - 0.04	50-80	0.02 - 0.05
50-80	0.008 - 0.015	50-80	0.015 - 0.04	50-80	0.02 - 0.05
no data available					
no data available					

Double-Chamfer



■ α -INOXthin coated

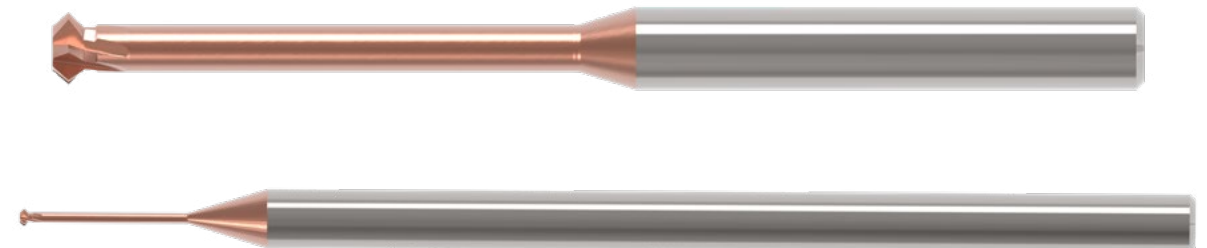


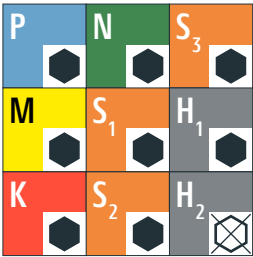
5 PRO's of the TARGETMILL:

- Forward & backward deburring for holes from Ø0.90 to Ø5.70
- Extremely versatile and flexible
- Universally applicable with 90° chamfer angle
- 5 to 6 teeth (cutting edges) enable high feed rates
- High process reliability without secondary burrs

Article number	D1 (mm)	D2 h6 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	GL (mm)	Flutes
AM.DC.090.90	Ø 0.90	Ø 0.54	Ø 3.00	0.36	8.00	60.00	5
AM.DC.140.90	Ø 1.40	Ø 0.84	Ø 3.00	0.56	10.00	60.00	5
AM.DC.180.90	Ø 1.80	Ø 1.08	Ø 4.00	0.72	12.00	60.00	5
AM.DC.220.90	Ø 2.20	Ø 1.48	Ø 4.00	0.72	14.00	60.00	5
AM.DC.280.90	Ø 2.80	Ø 1.68	Ø 4.00	1.12	18.00	60.00	5
AM.DC.370.90	Ø 3.70	Ø 2.22	Ø 4.00	1.48	24.00	70.00	5
AM.DC.470.90	Ø 4.70	Ø 2.82	Ø 6.00	1.88	30.00	80.00	5
AM.DC.570.90	Ø 5.70	Ø 3.42	Ø 6.00	2.28	36.00	80.00	6

Available from stock



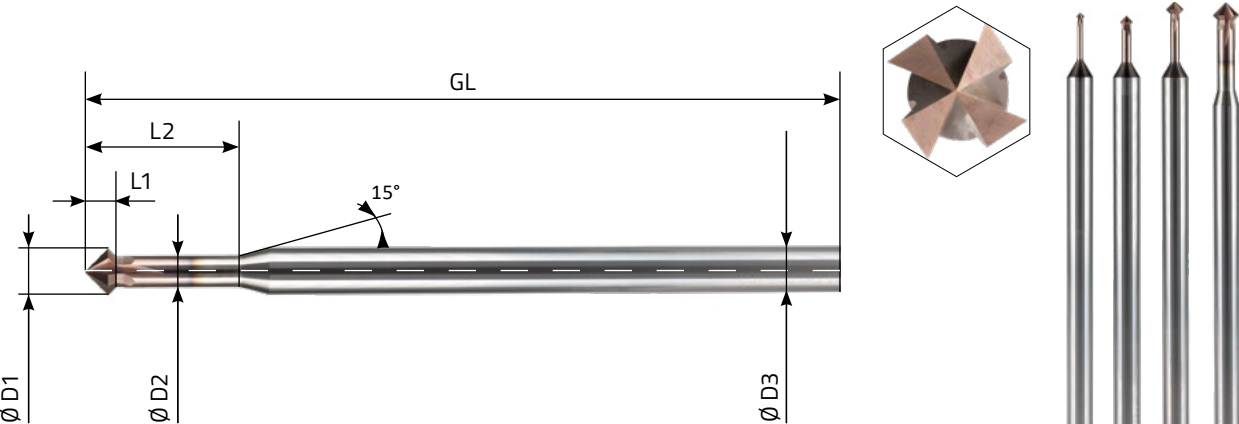
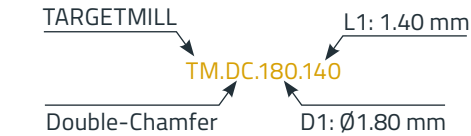
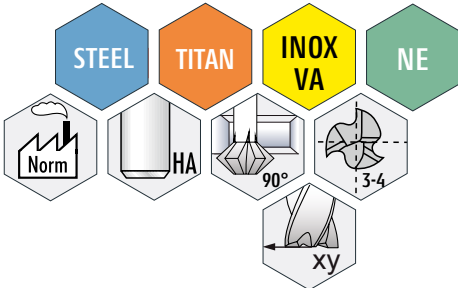


Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
P	Steels up to RM < 1200N/mm ²	1.0044	S275JR	AISI 1020
		1.0715	11SMn30	AISI 1215
		1.7131	16MnCr5	AISI 5115
		1.3505	100Cr6	AISI 52100
		1.7225	42CrMo4	AISI 4140
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C
		1.4542	X5CrNiCuNb 16-4	AISI 630 / ASTM 17-4 PH
		1.4545	X5CrNiCuNb 15-5	ASTM 15-5 PH
		1.4301	X5CrNi 18-10	AISI 304
		1.4435	X2CrNiMo 18-14-3	AISI 316L
K	Cast iron	0.6020	GG20	ASTM 30
		0.6030	GG30	ASTM 40B
		0.7040	GGG40	ASTM 60-40-18
		0.7060	GGG60	ASTM 80-60-03
N	Non-ferrous metals	3.2315	AlMgSi1	ASTM 6351
		2.0065	Cu-ETP / CW004A	UNS C11000
		2.0321	CuZn37 CW508L	UNS C27400
		2.0401	CuZn39Pb3 / CW614N	UNS C38500
		2.0966	CuAl10Ni5Fe4	UNS C63000
S (S1, S2, S3)	Heat-resistant steels, titanium, CrCo	2.4617	NiMo28	Hastelloy B-2
		2.4665	NiCr22Fe18Mo	Hastelloy X
		3.7165	TiAl6V4	ASTM B348 / F136
		9.9367	TiAl6Nb7	ASTM F1295
		2.4964	CoCr20W15Ni	Haynes 25
H	Hardened steels ≥ 55 HRC		CrCoMo28	ASTM F1537
		1.2510	100MnCrMoW4	AISI O1
		1.2379	X153CrMoV12	AISI D2

Recommended use Highly suitable Partially suitable Not recommended

Ø 0.9 mm - Ø 3.0 mm		Ø 3.0 mm - Ø 4.0 mm		Ø 4.0 mm - Ø 5.7 mm	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
100-140	0.02 - 0.035	100-140	0.02 - 0.045	100-140	0.05 - 0.065
100-140	0.02 - 0.03	100-140	0.02 - 0.04	100-140	0.05 - 0.055
80-110	0.01 - 0.03	80-110	0.015 - 0.045	80-110	0.045 - 0.055
70-100	0.01 - 0.025	70-100	0.015 - 0.045	70-100	0.045 - 0.055
80-140	0.01 - 0.04	80-140	0.02 - 0.055	80-140	0.05 - 0.065
80-160	0.02 - 0.04	80-160	0.035 - 0.06	80-160	0.055 - 0.06
80-140	0.02 - 0.045	80-140	0.035 - 0.06	80-140	0.055 - 0.06
80-120	0.02 - 0.045	80-120	0.035 - 0.06	80-120	0.055 - 0.06
50 - 80	0.008 - 0.015	50 - 80	0.015 - 0.04	50 - 80	0.03 - 0.05
50-80	0.008 - 0.015	50-80	0.015 - 0.04	50-80	0.03 - 0.05
50-80	0.008 - 0.015	50-80	0.015 - 0.04	50-80	0.03 - 0.05
no data available					
no data available					

Double-Chamfer



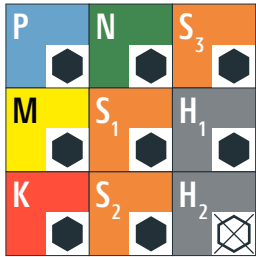
5 PRO's of the TARGETMILL:

- Forward & backward deburrer from Ø 1.8 mm to Ø 6 mm (D1)
- High flexibility in the variety of applications
- No secondary burrs form
- Universally usable in a wide variety of materials
- 3 to 4 flutes ensure excellent surface quality

Article number	Coating	Flutes	D1 (mm)	D2 h6 (mm)	D3 (mm)	L1 (mm)	L2 (mm)	GL (mm)
TM.DC.180.140	α-INOX	3	Ø 1.80	Ø 1.00	Ø 6.00	1.30	10.00	100.00
TM.DC.200.140	α-INOX	3	Ø 2.00	Ø 1.20	Ø 6.00	1.40	10.00	100.00
TM.DC.280.200	α-INOX	4	Ø 2.80	Ø 1.80	Ø 6.00	1.90	10.00	100.00
TM.DC.300.200	α-INOX	4	Ø 3.00	Ø 2.00	Ø 6.00	2.00	10.00	100.00
TM.DC.380.300	α-INOX	4	Ø 3.80	Ø 1.80	Ø 6.00	2.90	14.00	100.00
TM.DC.400.300	α-INOX	4	Ø 4.00	Ø 2.00	Ø 6.00	3.00	13.00	100.00
TM.DC.580.400	α-INOX	4	Ø 5.80	Ø 3.80	Ø 6.00	3.90	20.00	100.00
TM.DC.600.400	α-INOX	4	Ø 6.00	Ø 4.00	Ø 6.00	4.00	19.00	100.00

Available from stock





Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
P	Steels up to RM < 1200N/mm ²	1.0044	S275JR	AISI 1020
		1.0715	11SMn30	AISI 1215
		1.7131	16MnCr5	AISI 5115
		1.3505	100Cr6	AISI 52100
		1.7225	42CrMo4	AISI 4140
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C
		1.4542	X5CrNiCuNb 16-4	AISI 630 / ASTM 17-4 PH
		1.4545	X5CrNiCuNb 15-5	ASTM 15-5 PH
		1.4301	X5CrNi 18-10	AISI 304
		1.4435	X2CrNiMo 18-14-3	AISI 316L
K	Cast iron	0.6020	GG20	ASTM 30
		0.6030	GG30	ASTM 40B
		0.7040	GGG40	ASTM 60-40-18
		0.7060	GGG60	ASTM 80-60-03
N	Non-ferrous metals	3.2315	AlMgSi1	ASTM 6351
		2.0065	Cu-ETP / CW004A	UNS C11000
		2.0321	CuZn37 CW508L	UNS C27400
		2.0401	CuZn39Pb3 / CW614N	UNS C38500
		2.0966	CuAl10Ni5Fe4	UNS C63000
S (S1, S2, S3)	Heat-resistant steels, titanium, CrCo	2.4617	NiMo28	Hastelloy B-2
		2.4665	NiCr22Fe18Mo	Hastelloy X
		3.7165	TiAl6V4	ASTM B348 / F136
		9.9367	TiAl6Nb7	ASTM F1295
		2.4964	CoCr20W15Ni	Haynes 25
H	Hardened steels ≥ 55 HRC		CrCoMo28	ASTM F1537
		1.2510	100MnCrMoW4	AISI O1
		1.2379	X153CrMoV12	AISI D2

Recommended use Highly suitable Partially suitable Not recommended

Ø 2.0 mm - Ø 3.0 mm		Ø 3.0 mm - Ø 4.0 mm		Ø 4.0 mm - Ø 6.0 mm	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
100-140	0.02 - 0.035	100-140	0.02 - 0.045	100-140	0.05 - 0.065
100-140	0.02 - 0.03	100-140	0.02 - 0.04	100-140	0.05 - 0.055
80-110	0.01 - 0.03	80-110	0.015 - 0.045	80-110	0.045 - 0.055
70-100	0.01 - 0.025	70-100	0.015 - 0.045	70-100	0.045 - 0.055
80-140	0.01 - 0.04	80-140	0.02 - 0.055	80-140	0.05 - 0.065
80-160	0.02 - 0.04	80-160	0.035 - 0.06	80-160	0.055 - 0.06
80-140	0.02 - 0.045	80-140	0.035 - 0.06	80-140	0.055 - 0.06
80-120	0.02 - 0.045	80-120	0.035 - 0.06	80-120	0.055 - 0.06
50 - 80	0.008 - 0.015	50 - 80	0.015 - 0.04	50 - 80	0.03 - 0.05
50-80	0.008 - 0.015	50-80	0.015 - 0.04	50-80	0.03 - 0.05
50-80	0.008 - 0.015	50-80	0.015 - 0.04	50-80	0.03 - 0.05
no data available					
no data available					



Special tools

In addition to standard products, we work with our customers to realize special tool solutions for demanding processes and machining tasks.

Our customers benefit from our many years of machining experience and the lean structures of a medium-sized company. We are extremely flexible and can produce and deliver even individually developed tools within a very short time. Of course, we also optimize special tools already in use to customer specifications.

Our customers benefit from shorter machining and lead times, greater flexibility and reduced costs. Special tools help to produce complex geometries in a single machining step while optimizing accuracy on the component. With such tool concepts, we make a decisive contribution to helping our customers produce more economically and competitively. After all, it is not the cost of a tool but the cost per component that largely determines the total costs.

Our ability to develop trend-setting innovations is based on our competent and motivated specialists. They each take responsibility for developing a product and a machining process that leads to success. Our experts are very familiar with all conceivable machining technology processes. In cooperation with research and competence centers such as the Competence Center for Machining Production (KSF) in Tuttlingen, we continuously develop our know-how.

In cooperation with leading machine tool manufacturers, our specialists turn this into solutions for everyday production. We also continuously invest in state-of-the-art production technologies in order to manufacture future-oriented tools of the highest quality.

Manufacturing companies in numerous industries benefit from our high-performance tools, such as: Automotive, watch and jewelry industry, aerospace, medical and dental technology, mechanical and apparatus engineering, tool and mold making, transport and conveyor technology, electrical and electronics, writing instruments, food industry, petrochemicals, valves and fittings, hydraulics and pneumatics, household appliances.



Contract manufacturing

As a specialist for cutting tools, we grind all types of cutting edges on instruments according to individual specifications as a contract manufacturer for medical technology. Our customers supply the hardened blanks and we grind them according to customer drawings and specifications.

- Oval and Round Burr Shaver
- Reamers for tibial surgery and endoscopic applications
- Rasps for the metacarpal area
- (Bi-)cortical screws

Contact our tool grinding shop directly:

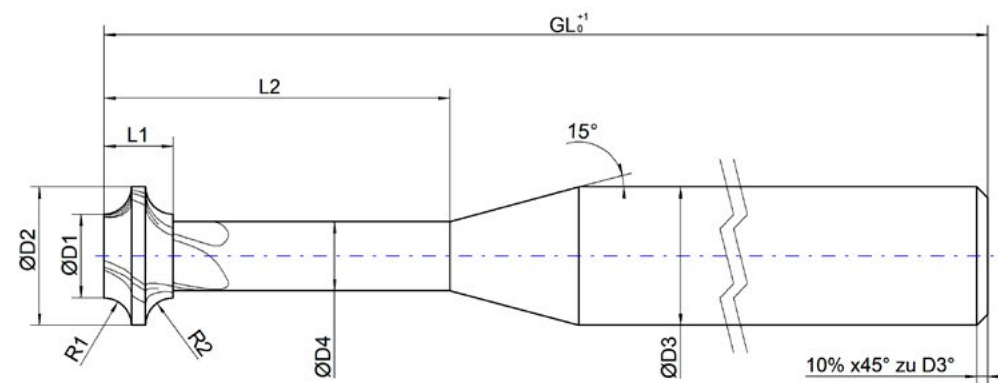
Tel. +49 (0) 7461 1657280
Fax +49 (0) 7461 1657281
kontakt@hb-microtec.de

Typical tools we grind

- Twist drills from Ø 1 mm to Ø 15 mm
- HSS drills from Ø 0.6 mm
- Medullary drills and medullary mills
- Trephine drills and trephine mills
- Saw teeth for e.g. knee saw blades and hip saw blades or saw blades for veterinary medicine
- Acetabular reamers
- Punch serrations
- Taps and thread cutters

Forward and reverse radius mill

Customized special mill suitable for your application



☐ Inquiry

☐ Order

Order number: _____

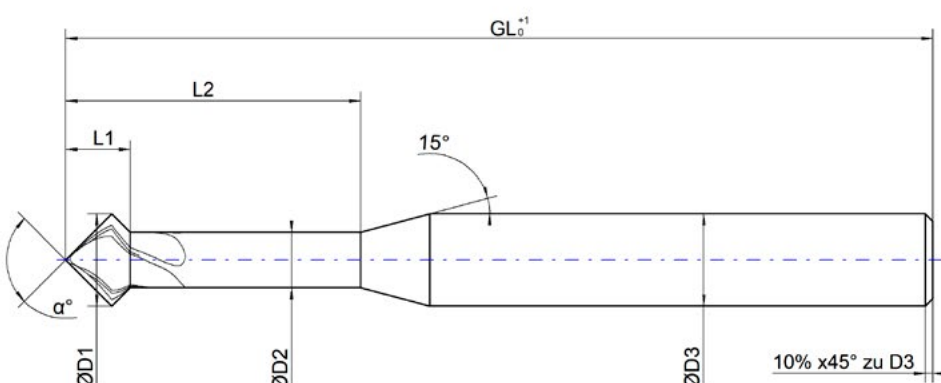
Other: _____

Dimensions: D ₁ : _____ GL: _____ R ₁ : _____ D ₂ : _____ L ₁ : _____ R ₂ : _____ D ₃ : _____ L ₂ : _____ Z: _____ D ₄ : _____	Coating: ☐ Coated*: _____ ☐ Uncoated	Cooling channels: ☐ Yes ☐ No Cutting direction: ☐ Left ☐ Right
Material to be machined: _____	Shank shape: _____	Quantity: _____
Date, signature & company stamp: _____		Contact person: _____

* Without further information, the most suitable coating will be used.

Forward and backward deburrer

Customized special mill suitable for your application



☐ Inquiry

☐ Order

Order number: _____

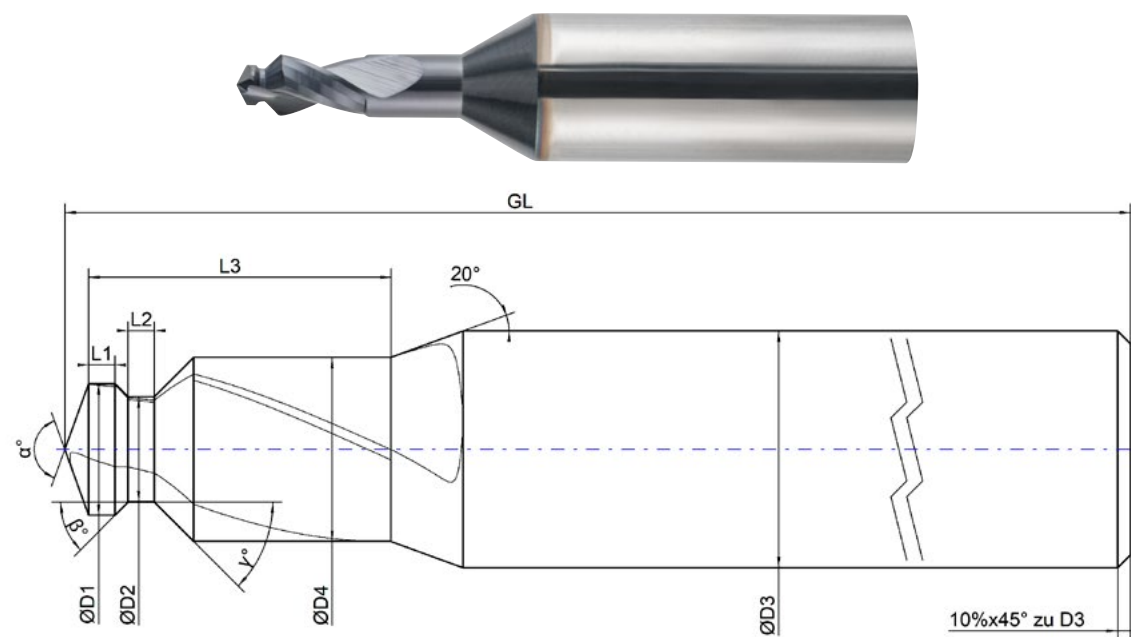
Other: _____

Dimensions: D ₁ : _____ GL: _____ α: _____ D ₂ : _____ L ₁ : _____ Z: _____ D ₃ : _____ L ₂ : _____	Coating: ☐ Coated*: _____ ☐ Uncoated	Cooling channels: ☐ Yes ☐ No Cutting direction: ☐ Left ☐ Right
Material to be machined: _____	Shank shape: _____	Quantity: _____
Date, signature & company stamp: _____		Contact person: _____

* Without further information, the most suitable coating will be used.

Special deburring drill

Drilling and countersinking + back deburring with one tool



☐ Inquiry

☐ Order

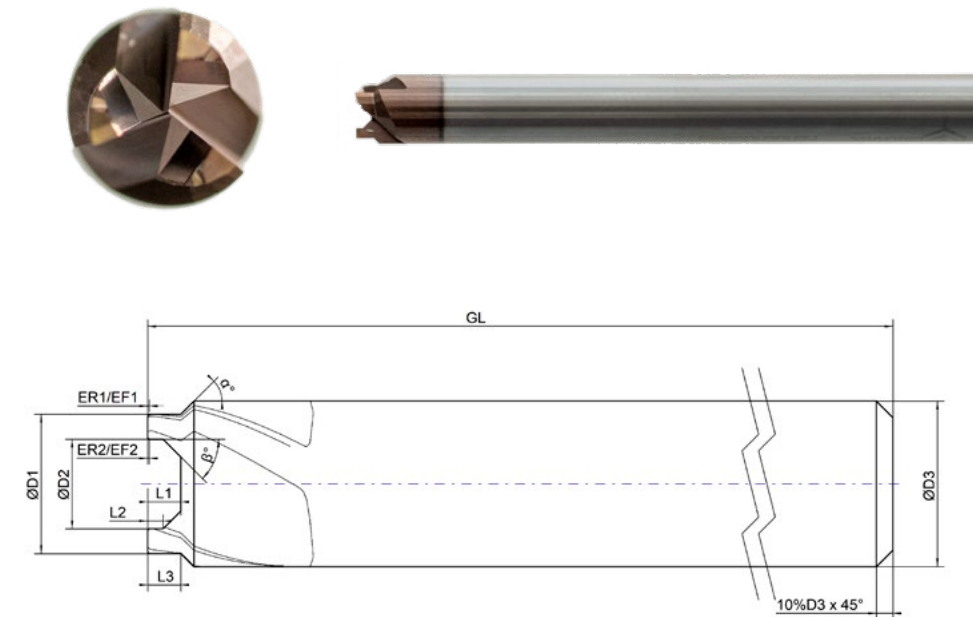
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Dimensions: D ₁ : _____ GL: _____ α: _____ D ₂ : _____ L ₁ : _____ β: _____ D ₃ : _____ L ₂ : _____ γ: _____ D ₄ : _____ L ₃ : _____ Z: _____	Coating: ☐ Coated*: _____ ☐ Uncoated	Cooling channels: ☐ Yes ☐ No Cutting direction: ☐ Left ☐ Right
Material to be machined: _____	Shank shape: _____	Quantity: _____
Date, signature & company stamp: _____		Contact person: _____

* Without further information, the most suitable coating will be used.

Crown countersink

Drilling + chamfering annular grooves with one tool



☐ Inquiry

☐ Order

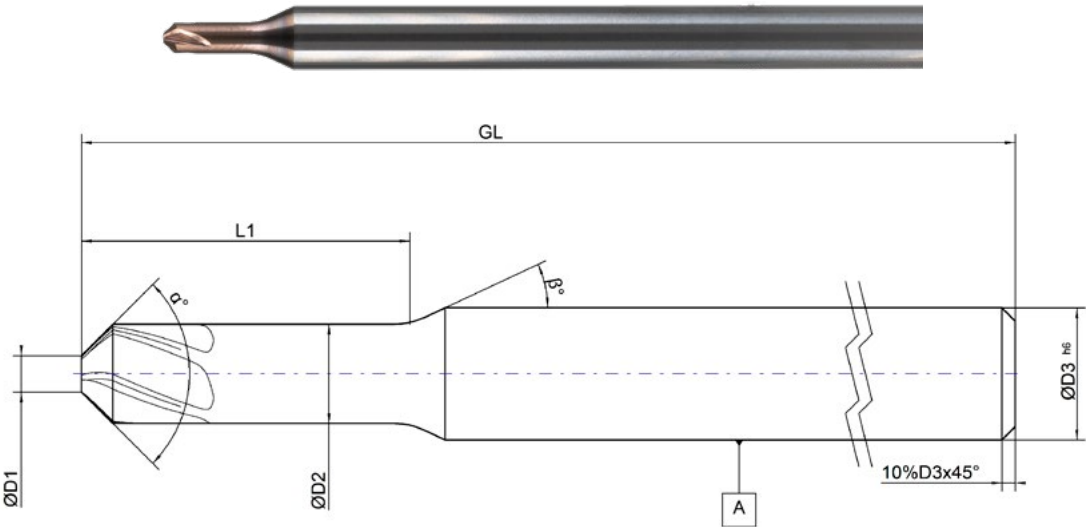
Order number: _____ Other: _____

Dimensions: D ₁ : _____ GL: _____ α: _____ D ₂ : _____ L ₁ : _____ β: _____ D ₃ : _____ L ₂ : _____ Z: _____ L ₃ : _____ ER ₁ /EF ₁ : _____ ER ₂ /EF ₂ : _____	Coating: ☐ Coated*: _____ ☐ Uncoated	Cooling channels: ☐ Yes ☐ No Cutting direction: ☐ Left ☐ Right
Material to be machined: _____	Shank shape: _____	Quantity: _____
Date, signature & company stamp: _____		Contact person: _____

* Without further information, the most suitable coating will be used.

Front-Chamfer

High-feed deburring or chamfering tools



☐ Inquiry

☐ Order

Order number: _____

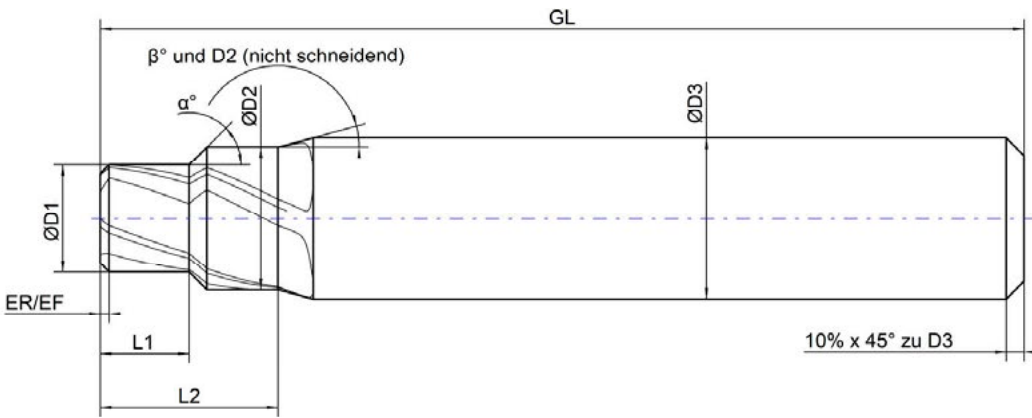
Other: _____

Dimensions: D ₁ : _____ GL: _____ α: _____ D ₂ : _____ L ₁ : _____ β: _____ D ₃ : _____ Z: _____	Coating: ☐ Coated*: _____ ☐ Uncoated	Cooling channels: ☐ Yes ☐ No Cutting direction: ☐ Left ☐ Right
Material to be machined: _____	Shank shape: _____	Quantity: _____
Date, signature & company stamp: _____		Contact person: _____

* Without further information, the most suitable coating will be used.

Shaping mill

Shaping mill combination tool: milling + chamfering



☐ Inquiry

☐ Order

Order number: _____

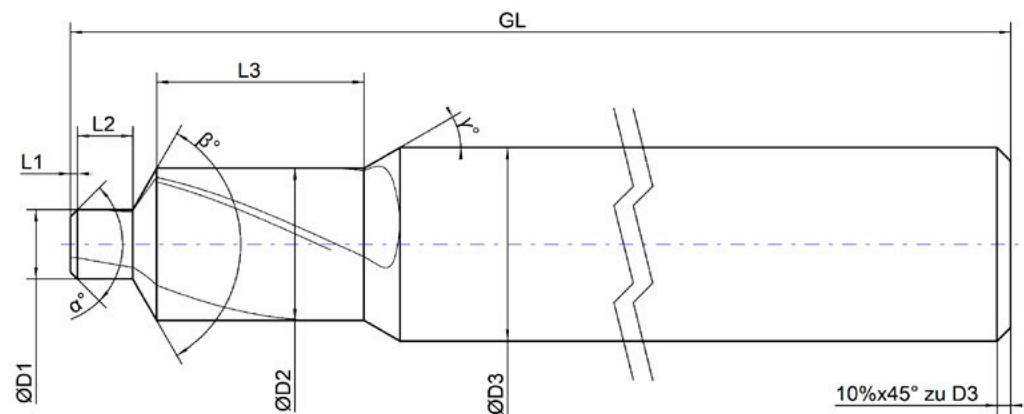
Other: _____

Dimensions: D ₁ : _____ GL: _____ α: _____ D ₂ : _____ L ₁ : _____ β: _____ D ₃ : _____ L ₂ : _____ Z: _____ ER/EF: _____	Coating: ☐ Coated*: _____ ☐ Uncoated	Cooling channels: ☐ Yes ☐ No Cutting direction: ☐ Left ☐ Right
Material to be machined: _____	Shank shape: _____	Quantity: _____
Date, signature & company stamp: _____		Contact person: _____

* Without further information, the most suitable coating will be used.

Piloted counterbore

Individually designed countersinks for optimal
„hole-chamfer-alignment“



☐ Inquiry

☐ Order

Order number: _____ Other: _____

Dimensions: D ₁ : _____ GL: _____ α: _____ D ₂ : _____ L ₁ : _____ β: _____ D ₃ : _____ L ₂ : _____ γ: _____ L ₃ : _____ Z: _____	Coating: ☐ Coated*: _____ ☐ Uncoated	Cooling channels: ☐ Yes ☐ No Cutting direction: ☐ Left ☐ Right
Material to be machined: _____	Shank shape: _____ Material: ☐ HM ☐ HSS	Quantity: _____
Date, signature & company stamp: _____		Contact person: _____

* Without further information, the most suitable coating will be used.



ACTIONMILL® **TARGETMILL®** by HB microtec



Standard Range

As specialists in machining, we consistently present pioneering manufacturing processes and tools for the automotive industry and medical technology. Customers can rely on our outstanding expertise.

Our highly trained and highly motivated specialists focus their know-how and qualifications on developing innovative and forward-looking machining solutions and putting them into practice for the benefit of our customers. Together with our customers, we develop forward-looking tool technologies, carefully matching substrates, geometries and coatings to the respective requirements. We focus on rotationally symmetrical tools from 0.1 to 8 mm in diameter. Maximum machining accuracy and process reliability are our top priorities.

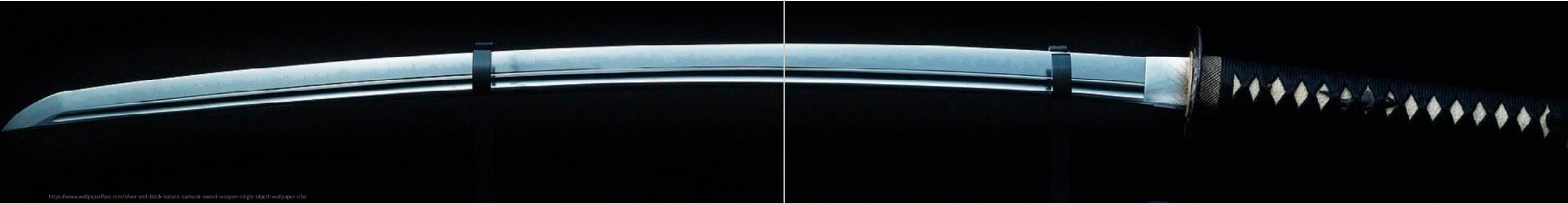
Our standard range includes tools for centering, chamfering, drilling, reaming and countersinking. Our aim is to create measurable added value for our customers with our tools. The ACTIONMILL® and TARGETMILL® tool series are successful examples of our innovative strength. We continuously develop these tools further and expand the product lines with additional variants and new products.

HB microtec - Who we are

HB microtec GmbH & Co. KG is a technologically leading manufacturer of tools for producing small precision components from difficult-to-machine materials. Particularly in medical technology, aerospace, tool and mold making and hydraulics, components have to be made from hard, heat-resistant and abrasive materials such as cobalt-chrome, nickel and titanium alloys. With our new standard milling tools ACTIONMILL® and TARGETMILL®, this is achieved far more economically and reliably than before.



Your used precision tool is in the best hands with us.



High-quality tools such as mills, countersinks, centering drills and reamers only perform their service perfectly if the cutting edges are always optimally sharpened. Where re-sharpening is possible, the price drops significantly the second and third time the cutting tools are used. No new raw material is required, only the cutting edges are resharpened and refined. With the regrinding service from HB microtec, we ensure that the economic efficiency is realized through the reconditioning of worn tool cutting edges to a high quality.

HB microtec expertise at a glance:

- Tool reconditioning to perfection
- Competent customer care and advice
- Everything from a single source: grinding, edge treatment and coating
- Original regrinding with the original geometry and coating of our own products
- Highest quality: 99% of the original HB microtec or partner tool
- Inspection report service for special tools
- Check for regrindability
- Short delivery time
- Best price guarantee - transparent pricing
- Pick-up and delivery service

Advantages that will convince you!

We carry out precise regrinding on state-of-the-art CNC grinding machines. We increase the service life of our tools by using a specially developed cutting edge preparation process. All our standardized and special tools are reconditioned using the same machines, the same processes and the same coatings. We can offer this service for all our own and related (e.g. our partner manufacturers) cutting tools.

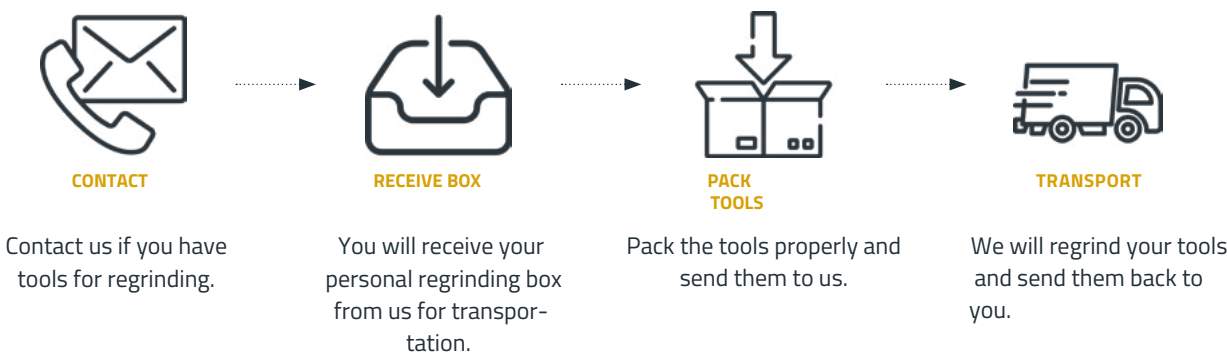
Our customers receive a transport-safe plastic box for shipping the tools to be reground, in which you can collect your worn tools. Then simply send us your tools for resharpening, or we will collect them from you by arrangement.

Would you like to learn more about our regrinding service for your tools?

Our experts will be happy to advise you.
Call +49 7461 1657280 or
Write to us at kontakt@hb-microtec.de



NEW SHARPNESS IN JUST 4 STEPS



ACTIONMILL regrinding
99% like new!



Consulting and Service

We provide practical advice to our customers on the entire manufacturing process. In addition to selecting suitable drilling, turning, milling and deburring tools, this also covers machining strategies and programming.

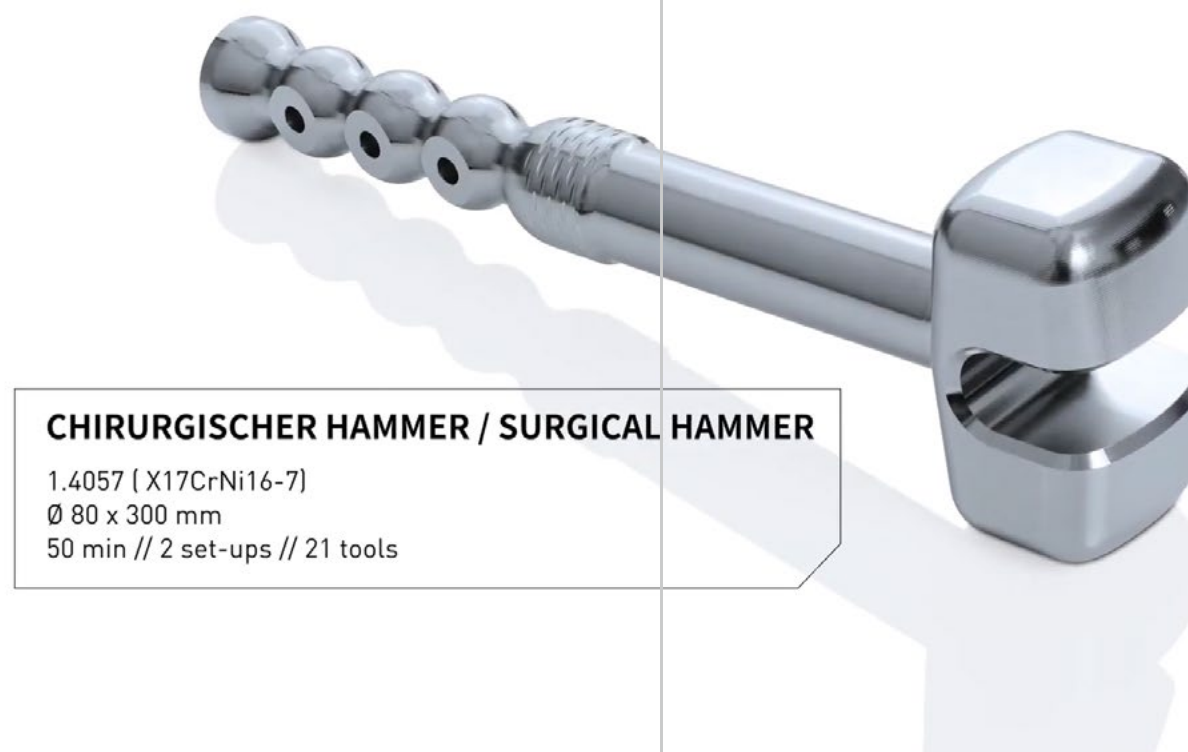
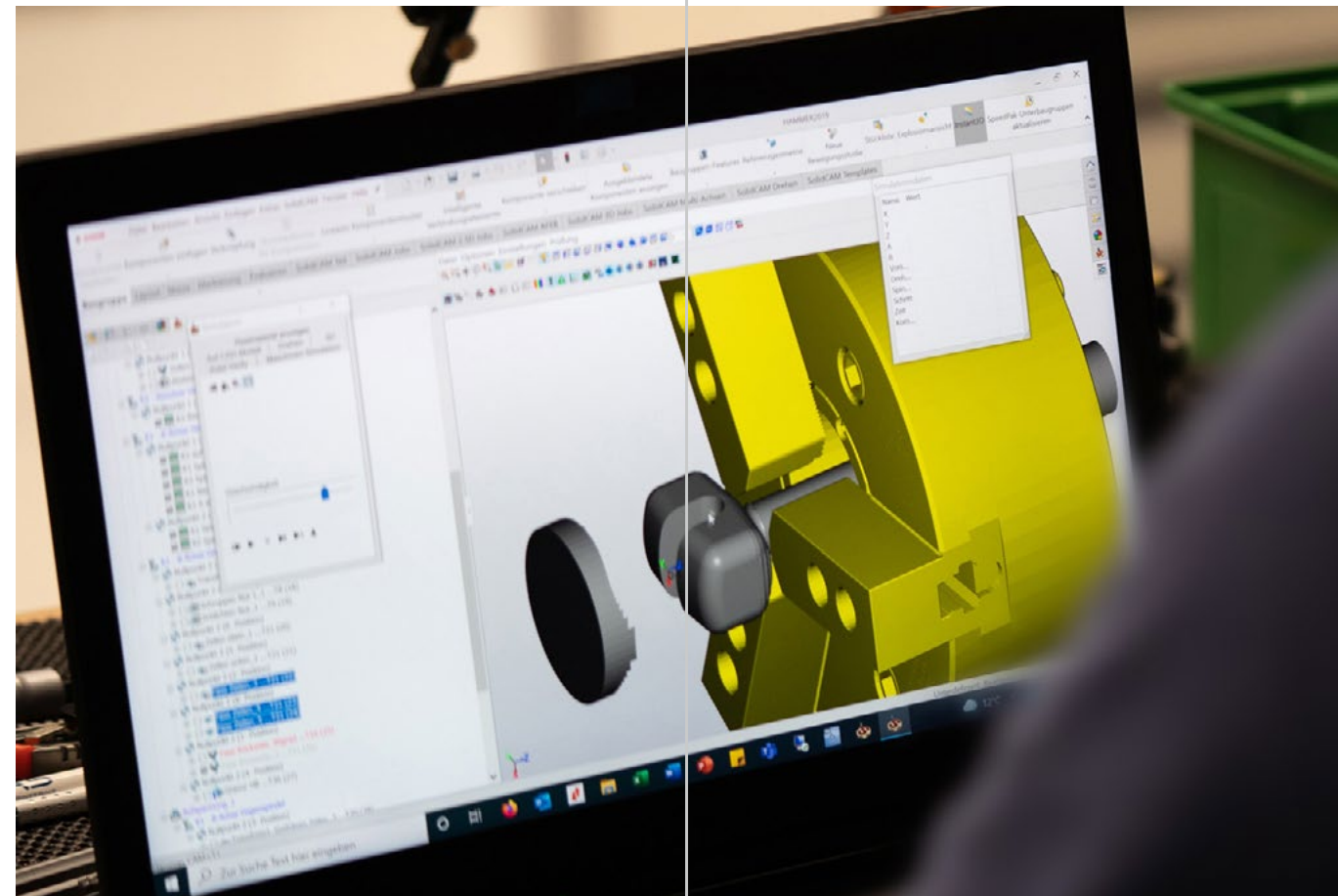
With our process-oriented and holistic solutions and our complete machining service, we are your ideal partner.

Our comprehensive services also make us a convincing OEM partner for machine tools.

Core competencies

- Comprehensive engineering
- Design of machining processes and cutting tools
- Concepts, project planning, design and manufacture of special tools
- Optimization of processes and machining strategies with the aim of process reliability, shorter run times and accuracy
- CNC and CAM programming (Solid CAM)
- Specialist seminars in turning, milling, drilling
- Fundamental technological tests for drilling, milling or turning
- Practical feasibility studies and tests
- Contract grinding and prototype manufacturing of medical technology tools

We support you with sound technical advice and assistance. Make use of our extensive know-how. We master every challenge with passion and find the right solution for every machining task!



CHIRURGISCHER HAMMER / SURGICAL HAMMER

1.4057 (X17CrNi16-7)
Ø 80 x 300 mm
50 min // 2 set-ups // 21 tools

Technical advice included in the price!

With our ACTIONTOOLS® and TARGETTOOLS®, you get more than just a "micro" tool catalog from us. Expert advice is in demand – and this is precisely where the tool specialists at HB microtec shine.

We have very broad machining knowledge and sound training in the use of your "ACTION" & "TARGET" tools on a wide variety of machine tool types. Whether CNC machining centers, single- or multi-spindle automatic lathes, short- and long-turning machines or transfer machines – we work with you to define the necessary requirements in order to create the best conditions for an optimal result.

For us, customer satisfaction means that the customer has not only received a good tool, but that everything is right in the end.

This includes not only a good price-performance ratio, but also competent technical advice when buying tools and on-site support when setting up and programming the machine.

Our advice starts with questions such as:

- Which material do you machine?
- Which coolant do you use?
- What is the maximum speed of your machine?
- Which machine tool types do you use?
- What are the kinematic conditions in the overall process? (Vibrations, strategy)
- Which programming system do you use? (Control? CAM?)
- Which clamping devices are used? (For the tool and the workpiece)
- Which tolerance range must the hole be in?
- Which batch size is to be machined?

Number	Icon	Description
1		Material: steel Material: Steel
2		Material: titanium Material: Titanium
3		Material: stainless and acid-resistant steels Material: INOX
4		Material: cast iron Material: Cast iron
5		Material: plastic Material: Plastic
6		Material: GFRP / CFRP Material: GRP / CFK
7		Material: graphite Material: Graphite
8		Non-ferrous metals Non-ferrous metals
9		Uncoated, blank Uncoated, Blank
10		Design according to HB microtec factory standard Works standard HB microtec
11		Shank form HA Shank design HA
12		305° full-wrap cutting edges 305° Full circumferential cutting
13		Corner radius (quarter circle) Corner radius (Quarter circle)
14		Spiral angle 15° (helix angle) Helix angle 15°
15		90° chamfer 90° Chamfer

Number	Icon	Description
16		90° chamfer 90° Chamfer
17		Point angle 30° Point angle 30°
18		Point angle 60° Point angle 60°
19		Point angle 90° Point angle 90°
20		Number of cutting edges 2 Cutting edges 2
21		Number of cutting edges 3 Cutting teeth number 3
22		Number of cutting edges 3-4 Cutting teeth number 3-4
23		Number of cutting edges 3-6 Cutting teeth number 3-6
24		Number of cutting edges 4-6 Cutting teeth number 4-6
25		Machining direction xyz Machining direction xyz
26		Machining direction xy Machining direction xy



"Install and ACTION!"

Because this is exactly what the worry-free cutting tools of the ACTIONMILL[®] range make possible! Or tools from the TARGETMILL[®] range that hit the target precisely!

High performance down to the last µm!

This way, the cost-benefit factor is perfectly tailored to you. Demanding and innovative high-performance mills of the highest quality require continuity not only in production, but from the entire HB microtec Team!

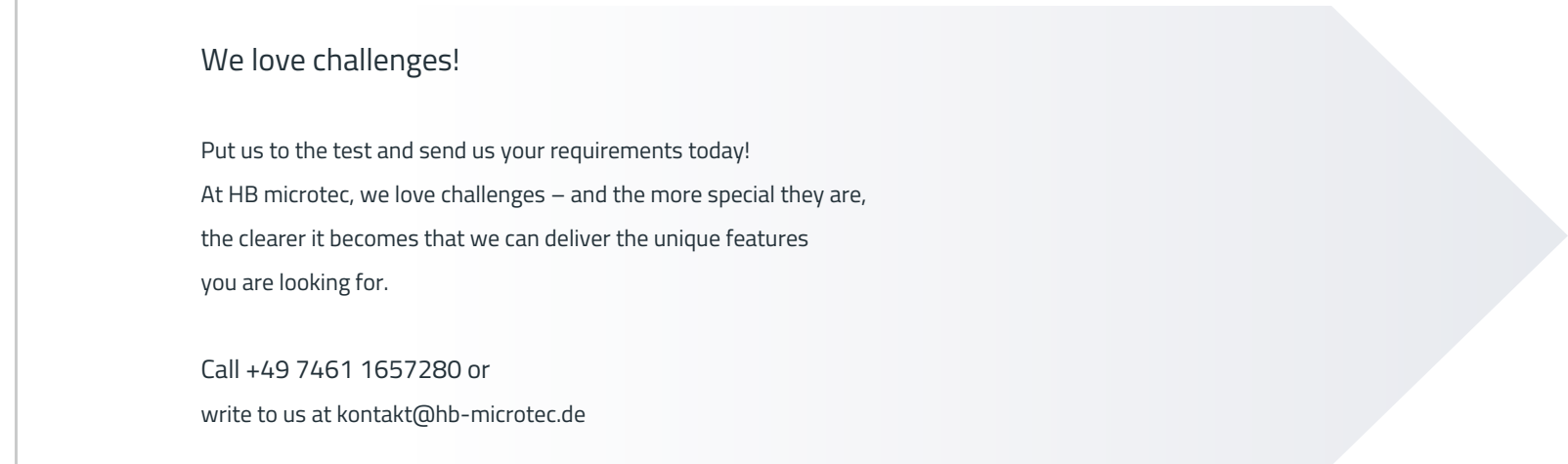
Repeatable!

This covers the entire process chain, from geometry development and design to the pre-treatment of the cutting edges, coating and finishing of the surfaces right through to the quality assurance of our ACTIONMILL[®] and TARGETMILL[®] tools.



What to expect from the entire HB microtec team:

- Innovative specialists in "micro" machining
- State-of-the-art manufacturing equipment and measuring instruments, enabling production in the micron range
- Motivation and passion for challenges
- Repeated precision in the µm range
- Practical service:
the HB microtec team accompanies and supports you in all phases and throughout the entire life cycle of your product
- High tool performance and high service competence
- E.g. ideas for customer-specific solutions, combination tools that often replace a number of individual tools and shorten machining time
- The highest possible standards of product quality
- Guaranteed series tool reliability and traceability (ISO 9001 certified)



We love challenges!

Put us to the test and send us your requirements today!
At HB microtec, we love challenges – and the more special they are, the clearer it becomes that we can deliver the unique features you are looking for.

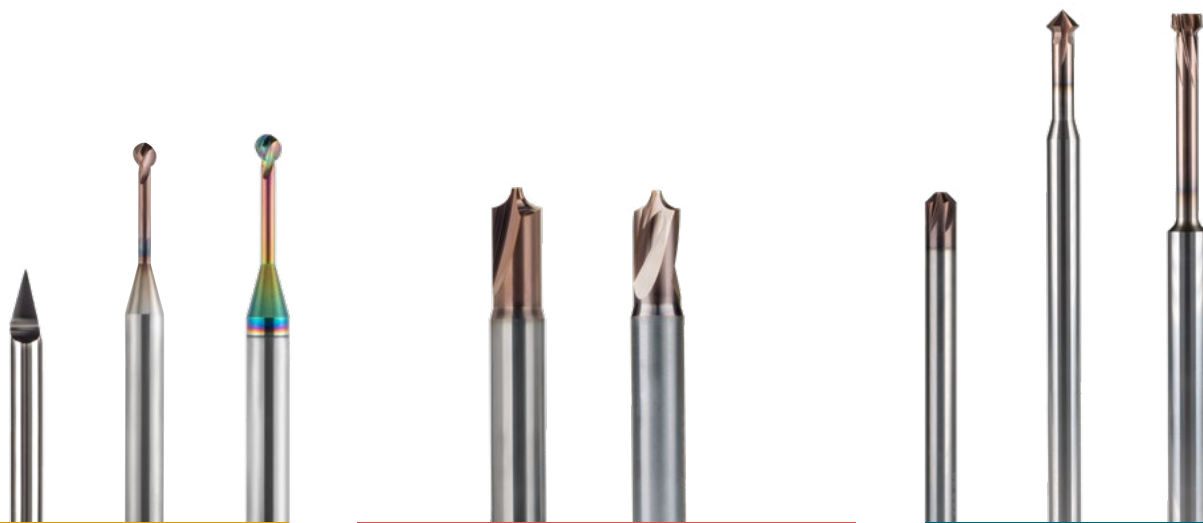
Call +49 7461 1657280 or
write to us at kontakt@hb-microtec.de



ACTIONMILL[®] **TARGETMILL[®]**
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