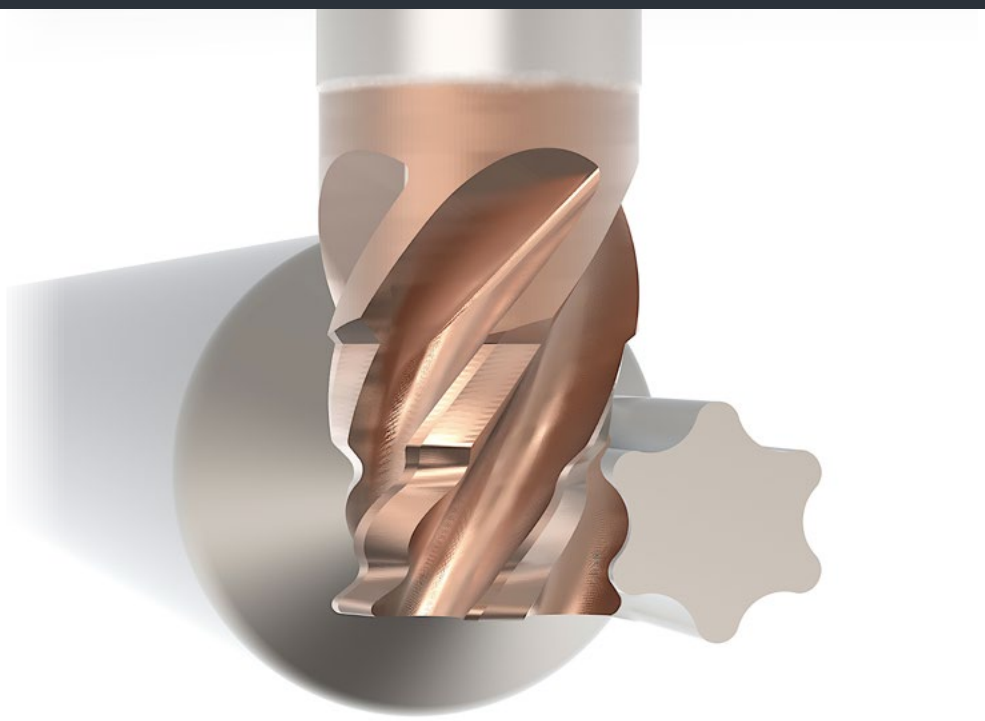
Torx® drilling and milling

HB microtec®
ACTIONTOOLS & ENGINEERING

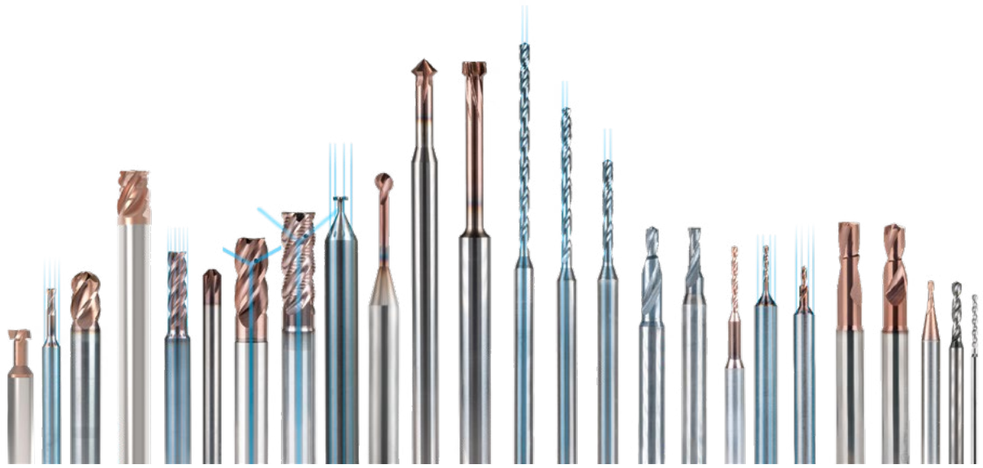


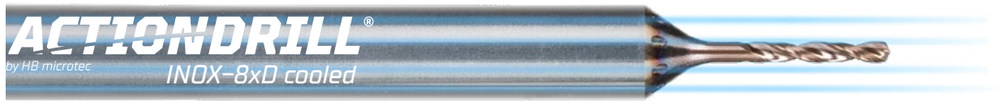
ACTIONMILL®
by HB microtec
Extern Starlobe

ACTIONMILL®
by HB microtec
Intern Starlobe

ACTIONDRILL®
by HB microtec
Intern Starlobe

About HB microtec





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.

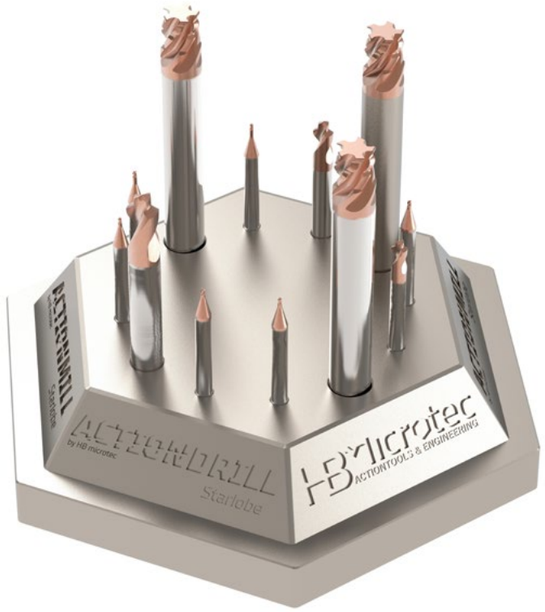
Standard Range

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 40 mm in diameter. Maximum machining accuracy and process reliability are our top priorities.

Our standard range includes tools for milling, deburring, 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.



Description

Medical technology - surgery and dentistry - in particular uses screws and wrenches with a star-shaped shaft profile with six rounded lobes to drive in screws. Described as internal or external hexalobular according to ISO 10664, the profile is generally known under the brand name TORX®.

The advantage is that star-shaped profiles transmit significantly higher torques than other key shapes of comparable diameter. However, producing small star profiles in particular has so far been complex and expensive.

Revolutionary manufacturing technology

Now we, the specialists at HB microtec in Tuttlingen, have developed micro tools and processes that truly revolutionize the production of these profiles!

Quickly and economically available thanks to standardization

Extensive standardization allows us to significantly reduce the cost and effort of manufacturing milling tools for TORX® profiles. At the same time, the innovative profile milling tools offer all the advantages known from our proven micro drilling and milling tools:

+ Maximum precision
+ Best concentricity
+ Optimized cutting edge geometries
+ Rounding of the cutting edges adapted to hard and tough materials – cobalt-chrome, titanium
+ Carefully matched, smooth TiAlSiN coatings (HiPIMS process)
+ Maximum wear resistance and process reliability

+ Long tool life in difficult materials
+ Optionally with sophisticated internal cooling (IKZ) especially for titanium machining

At short notice, we also produce individually designed and adapted tool geometries from our semi-standard tools.

Optimizing processes

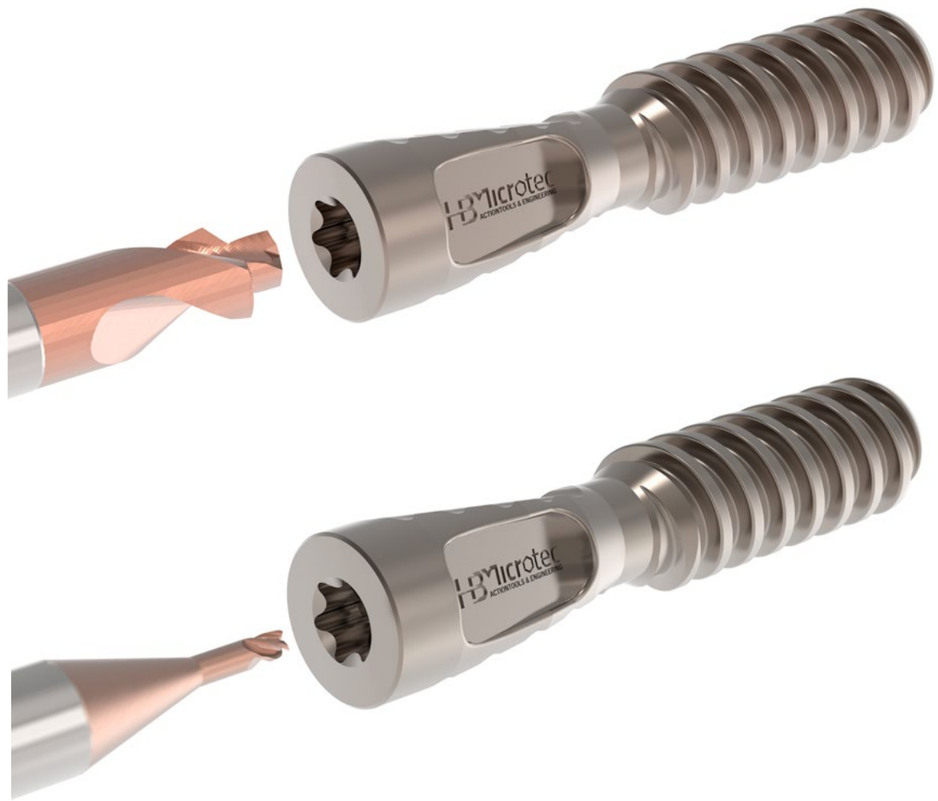
An outstanding milling tool can only be used to a limited extent without a suitable process. This is why we work with our customers to develop the optimum strategy and the right manufacturing process. Thanks to our extensive experience gained over many years in machining, especially in micromachining, we have the necessary know-how from practical manufacturing experience!

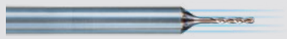
With our form milling tools and milling processes, we enable you to machine internal and external TORX® star profiles reliably, burr-free and exactly to specification. This ensures an optimal fit of the wrench for transmitting the highest torques.

Our profile mills for the reliable and precise production of TORX® profiles are already available in a wide range of dimensions.

We will be happy to advise you on choosing the right milling tools. Our highly qualified technicians can also implement individually designed tool geometries at short notice. In addition, we develop and implement together with you the optimally reliable process for milling high-precision internal and external TORX® profiles.

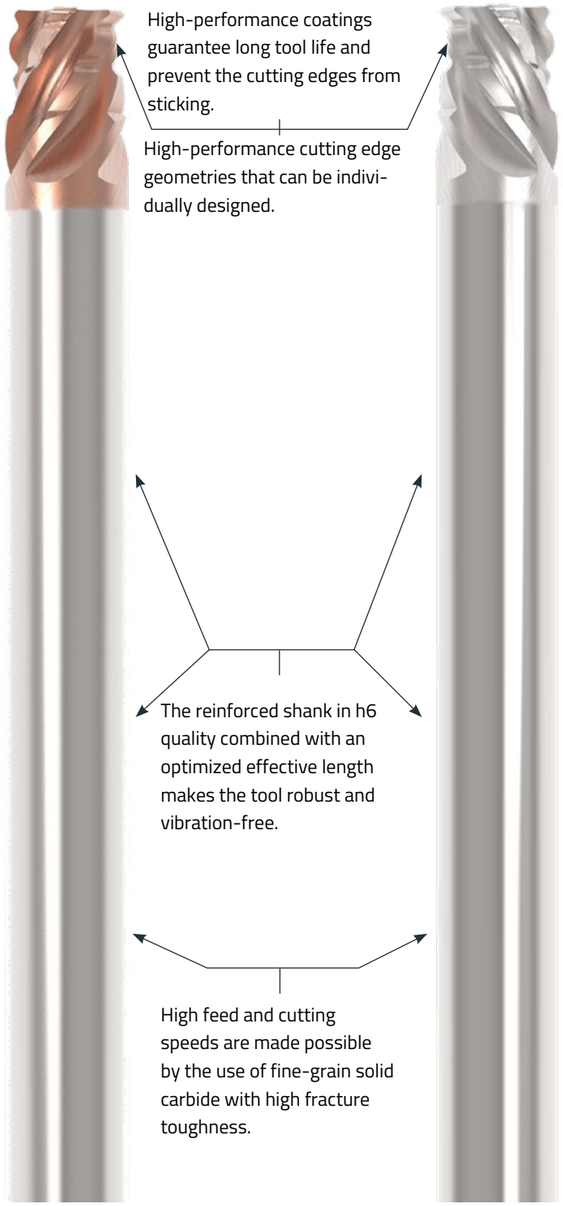
Challenge us! We are happy to assist you with advice and support!



	Product		Page
ACTIONMILL® Extern Starlobe	*External Torx® cutters - External Starlobe*		8
ACTIONMILL® Extern Starlobe	*Torx® T4*		10
ACTIONMILL® Extern Starlobe	*Torx® T5*		12
ACTIONMILL® Extern Starlobe	*Torx® T6*		14
ACTIONMILL® Extern Starlobe	*Torx® T7*		16
ACTIONMILL® Extern Starlobe	*Torx® T8*		18
ACTIONMILL® Extern Starlobe	*Torx® T10*		20
ACTIONMILL® Extern Starlobe	*Torx® T15*		22
ACTIONMILL® Extern Starlobe	*Torx® T20*		24
ACTIONMILL® Extern Starlobe	*Torx® T25*		26
ACTIONMILL® Extern Starlobe	*Torx® T30*		28
	Tools for internal Torx® machining		32
	Machining process internal Torx®		34
	Tool recommendation internal Torx®		36
ACTIONDRILL® INOX-8xD cooled	*INOX-8xD cooled*		38
TARGETDRILL® micro-INOX	*VHM micro-INOX 8xD*		40
ACTIONDRILL® Intern Starlobe	*Micro 140° combination drill for Torx®*		44
ACTIONDRILL® Intern Starlobe	*Torx® pilot drill dimensions according to ISO 10664*		46

	Product		Page
ACTIONMILL® INOX-micro Torx®	*Internal Torx® milling tools - Intern Starlobe*		52
ACTIONMILL® INOX-micro Torx®	*3xD micro Torx® mill*		54
ACTIONMILL® INOX-micro Torx®	*5xD micro Torx® mill*		56
ACTIONMILL® INOX-micro cooled	*INOX-micro cooled*		62
TARGETMILL® INOX-micro	*INOX-micro*		64
	Consulting and Service		68
	Formula index milling & drilling		70
	Why HB microtec?		72
	Cutting edge quality		73
	Icon legend		74

Extern Starlobe



High-performance coatings guarantee long tool life and prevent the cutting edges from sticking.

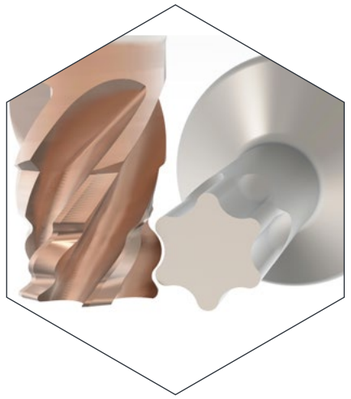
High-performance cutting edge geometries that can be individually designed.

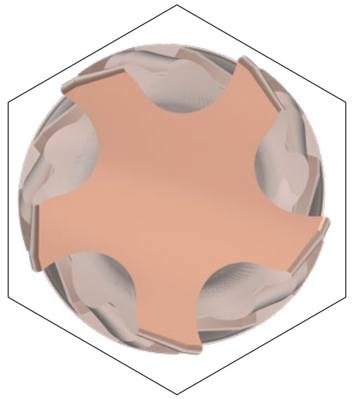
Torx® T4 to T30

from Ø 5.5 to Ø 10.0

The reinforced shank in h6 quality combined with an optimized effective length makes the tool robust and vibration-free.

High feed and cutting speeds are made possible by the use of fine-grain solid carbide with high fracture toughness.





Semi-standardized external Torx® mills

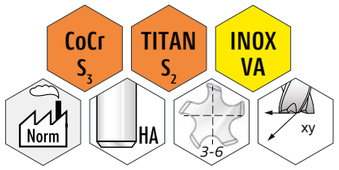
Product features

- For Torx® types 4 to 30
- Torx® shapes according to ISO 10664 or customized
- 3-10 flutes depending on diameter
- Straight or helical flutes selectable
- Unequal or equal flute spacing
- Technical advice and implementation according to your requirements

Short delivery times

- 2 weeks blank
- 3 – 4 weeks coated
- Always select the right high-performance coating:
  - *.00 = blank for plastics and non-ferrous metals*
  - *.01 = α-INOX for stainless steels ferritic, martensitic, austenitic & heat-resistant steels, titanium alloys, CrCo (M&S)*
  - *.02 = β-Titan for non-ferrous metals and titanium (N & S1)*
  - *.03 = γ-Steel for steels up to RM < 1200N/mm2 & cast iron (P & K)*

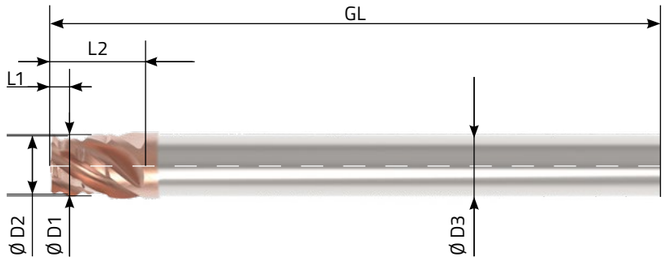
Torx® T4



ACTIONMILL | Torx® type | Ø-DA | Amount of flutes Blank or coated

AM.EX.T4.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT ← Flute pitch

Extern Starlobe | Rx | Ry | Ø-DB | Flute form



5 PRO's of the ACTIONMILL:

- Quickly available, semi-standardized external Torx® mill
- For milling Torx® type T4 according to ISO10664 or customized
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

Article number XXX.YYY.AAA.BBB	"Torx®" type	D1 (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	L2 (mm)	GL (mm)
AM.EX.T4.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT	T4	Ø5.5 - 6.0	Ø5.0 - 5.4	Ø6 h6	1.0 - 1.5	3.0 - 5.0	76

Example: Torx® mill; type 4, 6 cutting edges; straight with equal flute spacing and α-INOX coated

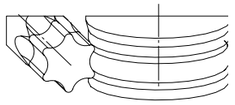
AM.EX.T4.009.031.130.092.6.01.ZG.G	T4	6	5.4	Ø6 h6	1.5	4.0	76

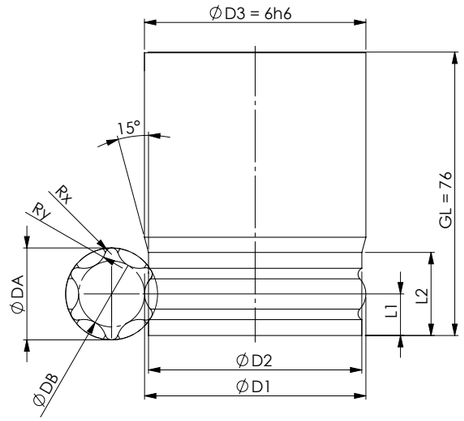
Minimum order quantity: 5 pieces

Delivery time: Blank 2 weeks; Coated 3-4 weeks

Torx® T4 D_1= 5.5mm - 6.0mm

Torx® Go gauge - standard dimensions per ISO 10664 (mean value)				
Torx®	ØDA	ØDB	Rx	Ry
4	1.30	0.92	0.09	0.31
5	1.42	1.02	0.11	0.33
6	1.70	1.22	0.13	0.38
7	2.02	1.44	0.16	0.45





Article number

(AM.EX.T4.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT): _____

☐ **Inquiry**

☐ **Order** **Order number:** _____ **Other:** _____

Dimensions (XXX.YYY.AAA.BBB):

D_1 Ø5.5-Ø6.0 _____ D_2 Ø5.0-Ø5.4 _____ R_x (XXX) _____

D_A (AAA) _____ L_1 1.0-1.5 mm _____ R_y (YYY) _____

D_B (BBB) _____ L_2 3.0-5.0 mm _____ Z _____

Material to be machined _____

Coating (BE):

☐ (.00) blank

☐ (.01) α-INOX

☐ (.02) β-Titan

☐ (.03) γ-Steel

Flute form (ZF):

☐ (.ZG) Straight

☐ (.ZD) Helical

Product attributes:

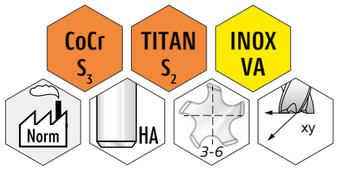
- Shank shape: HA
- Shank diameter D3h6: Ø6
- Raw material: R_HB.060.760.h6
- Overall length: 76
- Amount of flutes: Z3-6

Minimum order quantity from 5 pieces: _____

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

ØDA AAA	ØDB BBB	Rx XXX	Ry YYY	No. of flutes (Z)	Coating (BE)				Flute form (ZF)		Flute spacing (ZT)	
				Z3 – Z6	blank .00	α-INOX .01	β-Titan .02	γ-Steel .03	.ZG	.ZD	.G	.U
1.30	0.92	0.09	0.31	6	.01 (α-INOX)				.ZG (Z-Straight)		.G (even)	

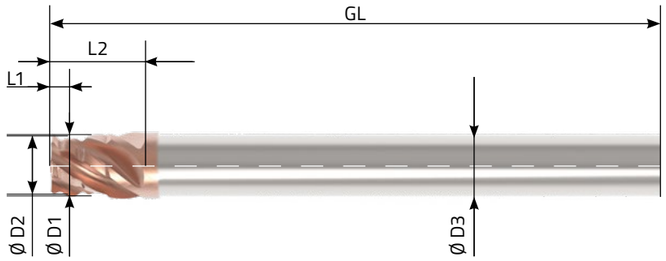
Torx® T5



ACTIONMILL Torx® type Ø-DA Amount of flutes Blank or coated

AM.EX.T5.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT ← Flute pitch

Extern Starlobe Rx Ry Ø-DB Flute form



5 PRO's of the ACTIONMILL:

- Quickly available, semi-standardized external Torx® mill
- For milling Torx® type T5 according to ISO10664 or customized
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

Article number XXX.YYY.AAA.BBB	"Torx®" type	D1 (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	L2 (mm)	GL (mm)
AM.EX.T5.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT	T5	Ø5.5 - 6.0	Ø5.0 - 5.4	Ø6 h6	1.0 - 1.5	3.0 - 5.0	76

Example: Torx® mill; type 5, 5 cutting edges; helical with unequal flute spacing and uncoated

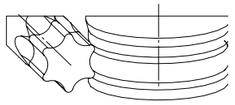
AM.EX.T5.011.033.142.102.5.00.ZD.U	T5	5.8	5.2	Ø6 h6	1.3	3.0	76

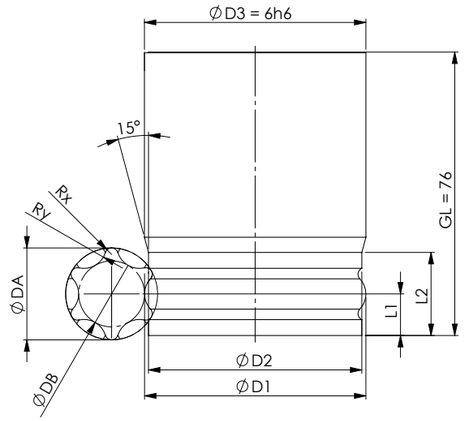
Minimum order quantity: 5 pieces

Delivery time: Blank 2 weeks; Coated 3-4 weeks

Torx® T5 D_1= 5.5mm - 6.0mm

Torx® Go gauge - standard dimensions per ISO 10664 (mean value)				
Torx®	ØDA	ØDB	Rx	Ry
4	1.30	0.92	0.09	0.31
5	1.42	1.02	0.11	0.33
6	1.70	1.22	0.13	0.38
7	2.02	1.44	0.16	0.45





Article number

(AM.EX.T5.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT): _____

☐ **Inquiry**

☐ **Order** **Order number:** _____ **Other:** _____

Dimensions (XXX.YYY.AAA.BBB):

D_1 Ø5.5-Ø6.0 _____ D_2 Ø5.0-Ø5.4 _____ R_x (XXX) _____

D_A (AAA) _____ L_1 1.0-1.5 mm _____ R_y (YYY) _____

D_B (BBB) _____ L_2 3.0-5.0 mm _____ Z _____

Material to be machined _____

Coating (BE):

☐ (.00) blank

☐ (.01) α-INOX

☐ (.02) β-Titan

☐ (.03) γ-Steel

Flute form (ZF):

☐ (.ZG) Straight

☐ (.ZD) Helical

Product attributes:

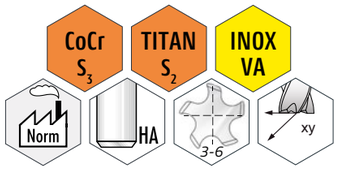
- Shank shape: HA
- Shank diameter D3h6: Ø6
- Raw material: R_HB.060.760.h6
- Overall length: 76
- Amount of flutes: Z3-6

Minimum order quantity from 5 pieces: _____

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

ØDA AAA	ØDB BBB	Rx XXX	Ry YYY	No. of flutes (Z)	Coating (BE)				Flute form (ZF)		Flute spacing (ZT)	
				Z3 – Z6	blank .00	α-INOX .01	β-Titan .02	γ-Steel .03	.ZG	.ZD	.G	.U
1.42	1.02	0.11	0.33	5	.00 (blank)				.ZD (Z-Helix)		.U (Unequal)	

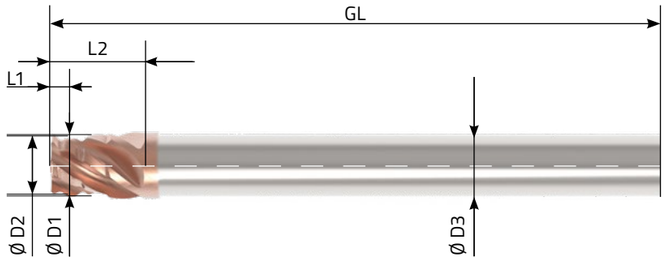
Torx® T6



ACTIONMILL | Torx® type | Ø-DA | Amount of flutes Blank or coated

AM.EX.T6.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT ← Flute pitch

Extern Starlobe | Rx | Ry | Ø-DB | Flute form



5 PRO's of the ACTIONMILL:

- Quickly available, semi-standardized external Torx® mill
- For milling Torx® type T6 according to ISO10664 or customized
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

Article number XXX.YYY.AAA.BBB	"Torx®" type	D1 (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	L2 (mm)	GL (mm)
AM.EX.T6.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT	T6	Ø5.5 - 6.0	Ø5.0 - 5.4	Ø6 h6	1.0 - 1.5	3.0 - 5.0	76

Example: Torx® mill; type 6, 4 cutting edges; straight with unequal flute spacing and β-TITAN coated

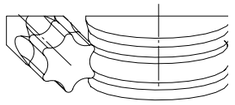
AM.EX.T6.013.038.170.122.4.02.ZG.U	T6	5.8	5.0	Ø6 h6	1.1	3.5	76

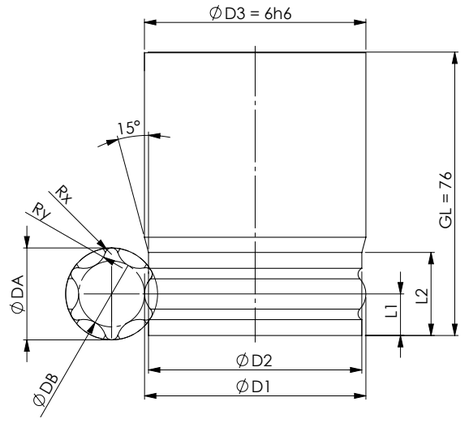
Minimum order quantity: 5 pieces

Delivery time: Blank 2 weeks; Coated 3-4 weeks

Torx® T6 D_1= 5.5mm - 6.0mm

Torx® Go gauge - standard dimensions per ISO 10664 (mean value)				
Torx®	ØDA	ØDB	Rx	Ry
4	1.30	0.92	0.09	0.31
5	1.42	1.02	0.11	0.33
6	1.70	1.22	0.13	0.38
7	2.02	1.44	0.16	0.45





Article number

(AM.EX.T6.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT): _____

☐ **Inquiry**

☐ **Order** **Order number:** _____ **Other:** _____

Dimensions (XXX.YYY.AAA.BBB):

D_1 Ø5.5-Ø6.0 _____ D_2 Ø5.0-Ø5.4 _____ R_x (XXX) _____

D_A (AAA) _____ L_1 1.0-1.5 mm _____ R_y (YYY) _____

D_B (BBB) _____ L_2 3.0-5.0 mm _____ Z _____

Material to be machined _____

Coating (BE):

☐ (.00) blank

☐ (.01) α-INOX

☐ (.02) β-Titan

☐ (.03) γ-Steel

Flute form (ZF):

☐ (.ZG) Straight

☐ (.ZD) Helical

Product attributes:

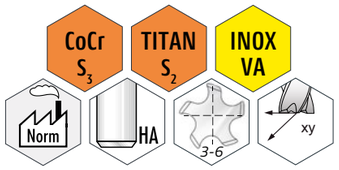
- Shank shape: HA
- Shank diameter D3h6: Ø6
- Raw material: R_HB.060.760.h6
- Overall length: 76
- Amount of flutes: Z3-6

Minimum order quantity from 5 pieces: _____

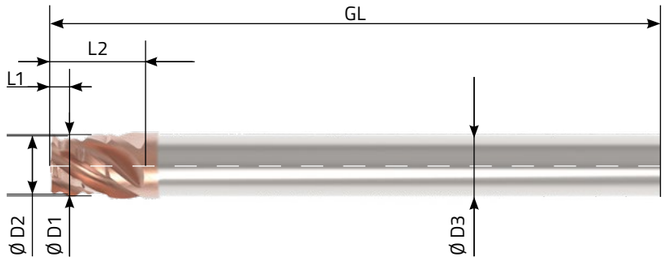
* Without further information, the most suitable coating will be used.

ØDA AAA	ØDB BBB	Rx XXX	Ry YYY	No. of flutes (Z)	Coating (BE)				Flute form (ZF)		Flute spacing (ZT)	
					blank .00	α-INOX .01	β-Titan .02	γ-Steel .03	.ZG	.ZD	.G	.U
1.70	1.22	0.13	0.38	4	.02 (β-Titan)				.ZG (Z-Straight)		.U (Unequal)	

Torx® T7



ACTIONMILL | Torx® type | Ø-DA | Amount of flutes Blank or coated
AM.EX.T7.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT ← Flute pitch
Extern Starlobe | Rx | Ry | Ø-DB | Flute form



5 PRO's of the ACTIONMILL:

- Quickly available, semi-standardized external Torx® mill
- For milling Torx® type T7 according to ISO10664 or customized
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

Article number XXX.YYY.AAA.BBB	"Torx®" type	D1 (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	L2 (mm)	GL (mm)
AM.EX.T7.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT	T7	Ø5.5 - 6.0	Ø5.0 - 5.4	Ø6 h6	1.0 - 1.5	3.0 - 5.0	76

Example: Torx® mill; type 7, 3 cutting edges; helical with equal flute spacing and γ-STEEL coated

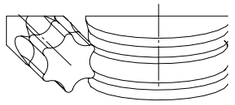
AM.EX.T7.016.045.202.144.3.03.ZD.G	T7	5.7	5.1	Ø6 h6	1.4	4.5	76

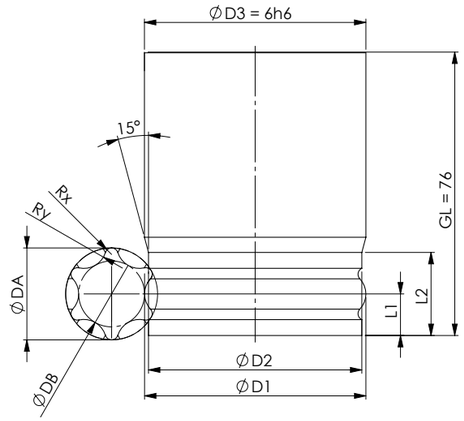
Minimum order quantity: 5 pieces

Delivery time: Blank 2 weeks; Coated 3-4 weeks

Torx® T7 D_1= 5.5mm - 6.0mm

Torx® Go gauge - standard dimensions per ISO 10664 (mean value)				
Torx®	ØDA	ØDB	Rx	Ry
4	1.30	0.92	0.09	0.31
5	1.42	1.02	0.11	0.33
6	1.70	1.22	0.13	0.38
7	2.02	1.44	0.16	0.45





Article number

(AM.EX.T7.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT): _____

☐ **Inquiry**

☐ **Order** **Order number:** _____ **Other:** _____

Dimensions (XXX.YYY.AAA.BBB):

D_1 Ø5.5-Ø6.0 _____ D_2 Ø5.0-Ø5.4 _____ R_x (XXX) _____

D_A (AAA) _____ L_1 1.0-1.5 mm _____ R_y (YYY) _____

D_B (BBB) _____ L_2 3.0-5.0 mm _____ Z _____

Material to be machined _____

Coating (BE):

☐ (.00) blank
☐ (.01) α-INOX
☐ (.02) β-Titan
☐ (.03) γ-Steel

Flute form (ZF):

☐ (.ZG) Straight
☐ (.ZD) Helical

Product attributes:

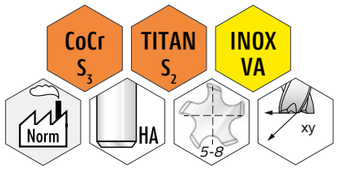
- Shank shape: HA
- Shank diameter D3h6: Ø6
- Raw material: R_HB.060.760.h6
- Overall length: 76
- Amount of flutes: Z3-6

Minimum order quantity from 5 pieces: _____

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

ØDA AAA	ØDB BBB	Rx XXX	Ry YYY	No. of flutes (Z)	Coating (BE)				Flute form (ZF)		Flute spacing (ZT)	
					blank .00	α-INOX .01	β-Titan .02	γ-Steel .03	.ZG	.ZD	.G	.U
				Z3 – Z6								
2.02	1.44	0.16	0.45	3	.03 (γ-Steel)				.ZD (Z-Helix)		.G (even)	

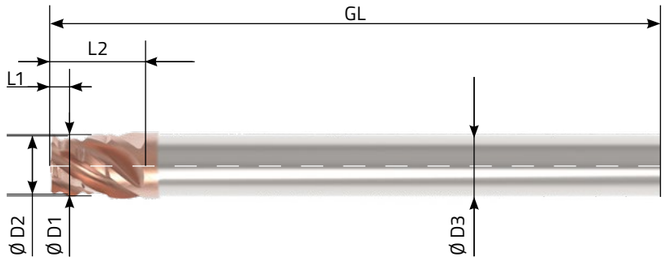
Torx® T8



ACTIONMILL Torx® type Ø-DA Amount of flutes Blank or coated

AM.EX.T8.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT ← Flute pitch

Extern Starlobe Rx Ry Ø-DB Flute form



5 PRO's of the ACTIONMILL:

- Quickly available, semi-standardized external Torx® mill
- For milling Torx® type T8 according to ISO10664 or customized
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

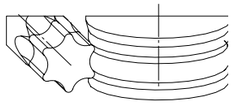
Article number XXX.YYY.AAA.BBB	"Torx®" type	D1 (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	L2 (mm)	GL (mm)
AM.EX.T8.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT	T8	Ø7.5 - 8.0	Ø7.0 - 7.4	Ø8 h6	1.5 - 2.0	3.0 - 5.0	80
Example: Torx® mill; type 8, 8 cutting edges; straight with equal flute spacing and α-INOX coated							
AM.EX.T8.019.051.234.168.8.01.ZG.G	T8	7.5	7.2	Ø8 h6	1.8	4.5	80

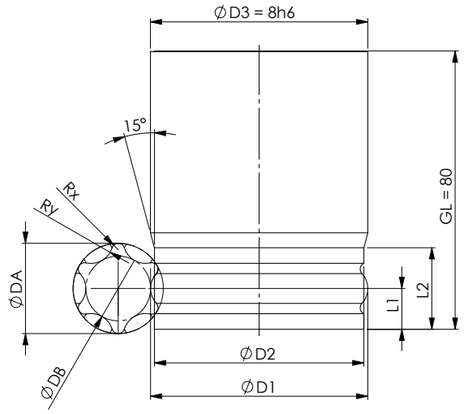
Minimum order quantity: 5 pieces

Delivery time: Blank 2 weeks; Coated 3-4 weeks

Torx® T8 D_1= 7.5mm - 8.0mm

Torx® Go gauge - standard dimensions per ISO 10664 (mean value)				
Torx®	ØDA	ØDB	Rx	Ry
8	2.34	1.68	0.19	0.51
10	2.77	1.99	0.23	0.60
15	3.30	2.36	0.27	0.71
20	3.88	2.77	0.31	0.86





Article number

(AM.EX.T8.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT): _____

☐ **Inquiry**

☐ **Order** **Order number:** _____ **Other:** _____

Dimensions (XXX.YYY.AAA.BBB):

D_1 Ø7.5-Ø8.0 _____ D_2 Ø7.0-Ø7.4 _____ R_x (XXX) _____

D_A (AAA) _____ L_1 1.5-2.0 mm _____ R_y (YYY) _____

D_B (BBB) _____ L_2 3.0-5.0 mm _____ Z _____

Material to be machined _____

Coating (BE):

☐ (.00) blank

☐ (.01) α-INOX

☐ (.02) β-Titan

☐ (.03) γ-Steel

Flute form (ZF):

☐ (.ZG) Straight

☐ (.ZD) Helical

Product attributes:

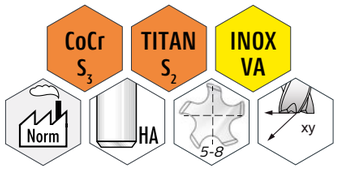
- Shank shape: HA
- Shank diameter D3h6: Ø8
- Raw material: R_HB.080.800.h6
- Overall length: 80
- Amount of flutes: Z5-8

Minimum order quantity from 5 pieces: _____

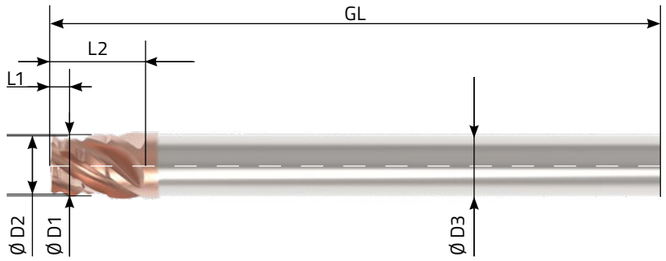
* Without further information, the most suitable coating will be used.

ØDA AAA	ØDB BBB	Rx XXX	Ry YYY	No. of flutes (Z)	Coating (BE)				Flute form (ZF)		Flute spacing (ZT)	
				Z5 – Z8	blank .00	α-INOX .01	β-Titan .02	γ-Steel .03	.ZG	.ZD	.G	.U
2.34	1.68	0.19	0.51	8	.01 (α-INOX)				.ZG (Z-Straight)		.G (even)	

Torx® T10



ACTIONMILL Torx® type Ø-DA Amount of flutes Blank or coated
AM.EX.T10.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT ← Flute pitch
Extern Starlobe Rx Ry Ø-DB Flute form



5 PRO's of the ACTIONMILL:

- Quickly available, semi-standardized external Torx® mill
- For milling Torx® type T10 according to ISO10664 or customized
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

Article number XXX.YYY.AAA.BBB	"Torx®" type	D1 (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	L2 (mm)	GL (mm)
AM.EX.T10.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT	T10	Ø7.5 - 8.0	Ø7.0 - 7.4	Ø8 h6	1.5 - 2.0	3.0 - 5.0	80

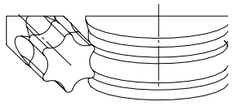
Example: Torx® mill; type 10, 7 cutting edges; helical with unequal flute spacing and uncoated

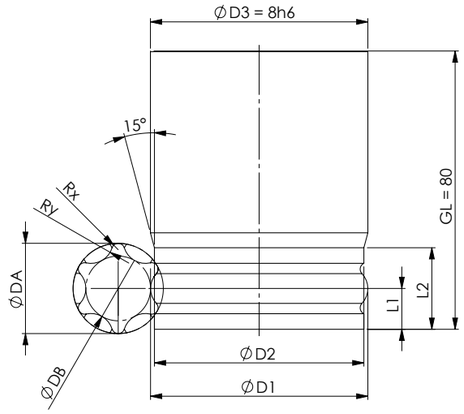
AM.EX.T10.023.060.277.199.7.00.ZD.U	T10	7.8	7.2	Ø8 h6	1.8	4.5	80

Minimum order quantity: 5 pieces | Delivery time: Blank 2 weeks; Coated 3-4 weeks

Torx® $T_1$0 D1= 7.5mm - 8.0mm

Torx® Go gauge - standard dimensions per ISO 10664 (mean value)				
Torx®	ØDA	ØDB	Rx	Ry
8	2.34	1.68	0.19	0.51
10	2.77	1.99	0.23	0.60
15	3.30	2.36	0.27	0.71
20	3.88	2.77	0.31	0.86





Article number

(AM.EX.T10.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT): _____

☐ **Inquiry**

☐ **Order** **Order number:** _____ **Other:** _____

Dimensions (XXX.YYY.AAA.BBB):

D_1 Ø7.5-Ø8.0 _____ D_2 Ø7.0-Ø7.4 _____ R_x (XXX) _____

D_A (AAA) _____ L_1 1.5-2.0 mm _____ R_y (YYY) _____

D_B (BBB) _____ L_2 3.0-5.0 mm _____ Z _____

Material to be machined _____

Coating (BE):

☐ (.00) blank
☐ (.01) α-INOX
☐ (.02) β-Titan
☐ (.03) γ-Steel

Flute form (ZF):

☐ (.ZG) Straight
☐ (.ZD) Helical

Product attributes:

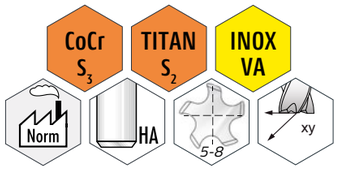
- Shank shape: HA
- Shank diameter D3h6: Ø8
- Raw material: R_HB.080.800.h6
- Overall length: 80
- Amount of flutes: Z5-8

Minimum order quantity from 5 pieces: _____

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

ØDA AAA	ØDB BBB	Rx XXX	Ry YYY	No. of flutes (Z)	Coating (BE)				Flute form (ZF)		Flute spacing (ZT)	
					blank .00	α-INOX .01	β-Titan .02	γ-Steel .03	.ZG	.ZD	.G	.U
2.77	1.99	0.23	0.60	7	.00 (blank)				.ZD (Z-Helix)		.U (Unequal)	

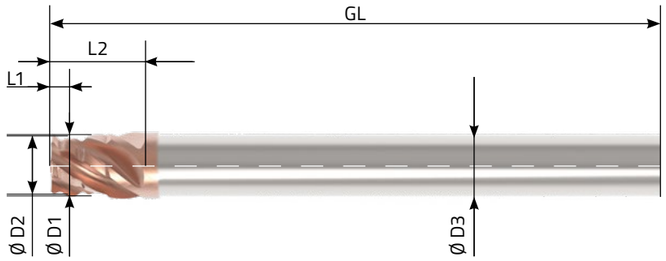
Torx® T15



ACTIONMILL Torx® type Ø-DA Amount of flutes Blank or coated

AM.EX.T15.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT ← Flute pitch

Extern Starlobe Rx Ry Ø-DB Flute form



5 PRO's of the ACTIONMILL:

- Quickly available, semi-standardized external Torx® mill
- For milling Torx® type T15 according to ISO10664 or customized
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

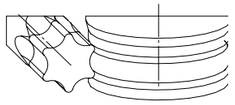
Article number XXX.YYY.AAA.BBB	"Torx®" type	D1 (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	L2 (mm)	GL (mm)
AM.EX.T15.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT	T15	Ø7.5 - 8.0	Ø7.0 - 7.4	Ø8 h6	1.5 - 2.0	3.0 - 5.0	80
Example: Torx® mill; type 15, 6 cutting edges; straight with unequal flute spacing and β-TITAN coated							
AM.EX.T15.027.071.330.236.6.02.ZG.U	T15	7.8	7.4	Ø8 h6	1.9	4.3	80

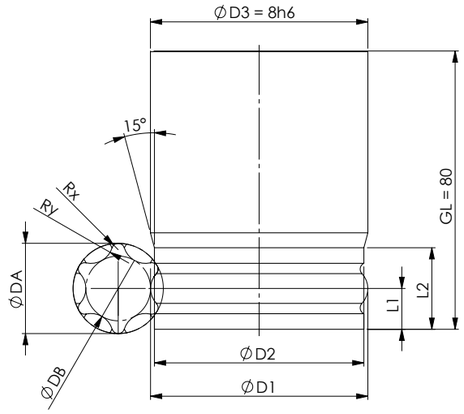
Minimum order quantity: 5 pieces

Delivery time: Blank 2 weeks; Coated 3-4 weeks

Torx® $T_1$5 D1= 7.5mm - 8.0mm

Torx® Go gauge - standard dimensions per ISO 10664 (mean value)				
Torx®	ØDA	ØDB	Rx	Ry
8	2.34	1.68	0.19	0.51
10	2.77	1.99	0.23	0.60
15	3.30	2.36	0.27	0.71
20	3.88	2.77	0.31	0.86





Article number

(AM.EX.T15.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT): _____

☐ **Inquiry**

☐ **Order** **Order number:** _____ **Other:** _____

Dimensions (XXX.YYY.AAA.BBB):

D_1 Ø7.5-Ø8.0 _____ D_2 Ø7.0-Ø7.4 _____ R_x (XXX) _____

D_A (AAA) _____ L_1 1.5-2.0 mm _____ R_y (YYY) _____

D_B (BBB) _____ L_2 3.0-5.0 mm _____ Z _____

Material to be machined _____

Coating (BE):

☐ (.00) blank

☐ (.01) α-INOX

☐ (.02) β-Titan

☐ (.03) γ-Steel

Flute form (ZF):

☐ (.ZG) Straight

☐ (.ZD) Helical

Product attributes:

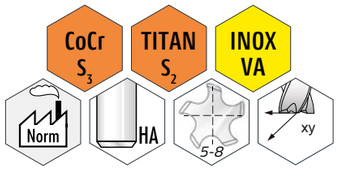
- Shank shape: HA
- Shank diameter D3h6: Ø8
- Raw material: R_HB.080.800.h6
- Overall length: 80
- Amount of flutes: Z5-8

Minimum order quantity from 5 pieces: _____

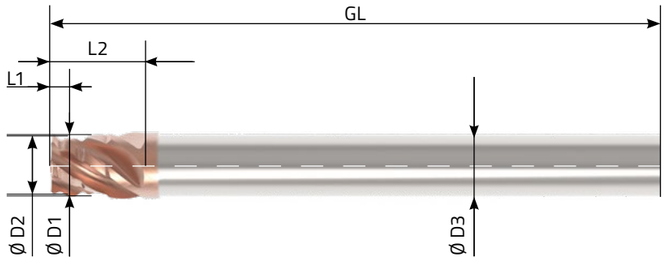
* Without further information, the most suitable coating will be used.

ØDA AAA	ØDB BBB	Rx XXX	Ry YYY	No. of flutes (Z)	Coating (BE)				Flute form (ZF)		Flute spacing (ZT)	
				Z5 – Z8	blank .00	α-INOX .01	β-Titan .02	γ-Steel .03	.ZG	.ZD	.G	.U
3.30	2.36	0.27	0.71	6	.02 (β-Titan)				.ZG (Z-Straight)		.U (Unequal)	

Torx® T20



ACTIONMILL Torx® type Ø-DA Amount of flutes Blank or coated
AM.EX.T20.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT ← Flute pitch
Extern Starlobe Rx Ry Ø-DB Flute form



5 PRO's of the ACTIONMILL:

- Quickly available, semi-standardized external Torx® mill
- For milling Torx® type T20 according to ISO10664 or customized
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

Article number XXX.YYY.AAA.BBB	"Torx®" type	D1 (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	L2 (mm)	GL (mm)
AM.EX.T20.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT	T20	Ø7.5 - 8.0	Ø7.0 - 7.4	Ø8 h6	1.5 - 2.0	3.0 - 5.0	80

Example: Torx® mill; type 20, 5 cutting edges; helical with equal flute spacing and γ-STEEL coated

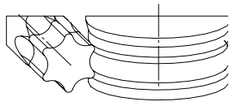
AM.EX.T20.031.086.388.277.5.03.ZD.G	T20	8.0	7.4	Ø8 h6	2.0	4.8	80

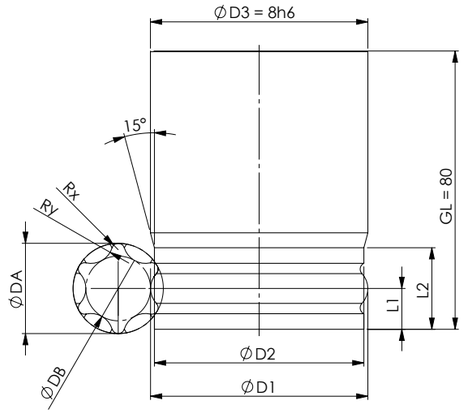
Minimum order quantity: 5 pieces

Delivery time: Blank 2 weeks; Coated 3-4 weeks

Torx® T20 D_1= 7.5mm - 8.0mm

Torx® Go gauge - standard dimensions per ISO 10664 (mean value)				
Torx®	ØDA	ØDB	Rx	Ry
8	2.34	1.68	0.19	0.51
10	2.77	1.99	0.23	0.60
15	3.30	2.36	0.27	0.71
20	3.88	2.77	0.31	0.86





Article number

(AM.EX.T20.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT): _____

☐ **Inquiry**

☐ **Order** **Order number:** _____ **Other:** _____

Dimensions (XXX.YYY.AAA.BBB):

D_1 Ø7.5-Ø8.0 _____ D_2 Ø7.0-Ø7.4 _____ R_x (XXX) _____

D_A (AAA) _____ L_1 1.5-2.0 mm _____ R_y (YYY) _____

D_B (BBB) _____ L_2 3.0-5.0 mm _____ Z _____

Material to be machined _____

Coating (BE):

☐ (.00) blank

☐ (.01) α-INOX

☐ (.02) β-Titan

☐ (.03) γ-Steel

Flute form (ZF):

☐ (.ZG) Straight

☐ (.ZD) Helical

Product attributes:

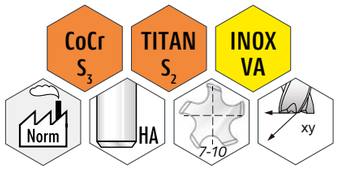
- Shank shape: HA
- Shank diameter D3h6: Ø8
- Raw material: R_HB.080.800.h6
- Overall length: 80
- Amount of flutes: Z5-8

Minimum order quantity from 5 pieces: _____

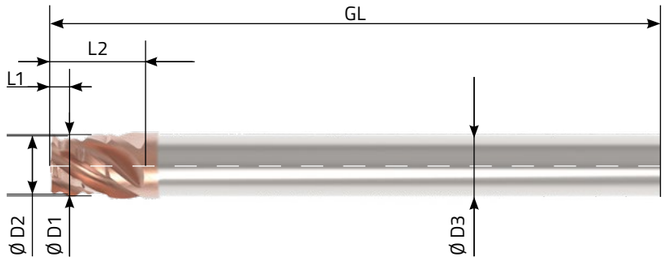
* Without further information, the most suitable coating will be used.

ØDA AAA	ØDB BBB	Rx XXX	Ry YYY	No. of flutes (Z)	Coating (BE)				Flute form (ZF)		Flute spacing (ZT)	
				Z5 – Z8	blank .00	α-INOX .01	β-Titan .02	γ-Steel .03	.ZG	.ZD	.G	.U
3.88	2.77	0.31	0.86	5	.03 (γ-Steel)				.ZD (Z-Helix)		.G (even)	

Torx® T25



ACTIONMILL Torx® type Ø-DA Amount of flutes Blank or coated
AM.EX.T25.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT ← Flute pitch
Extern Starlobe Rx Ry Ø-DB Flute form



5 PRO's of the ACTIONMILL:

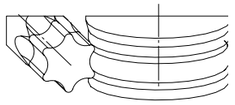
- Quickly available, semi-standardized external Torx® mill
- For milling Torx® type T25 according to ISO10664 or customized
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

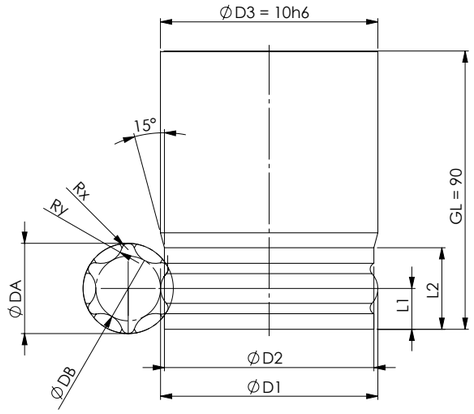
Article number XXX.YYY.AAA.BBB	"Torx®" type	D1 (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	L2 (mm)	GL (mm)
AM.EX.T25.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT	T25	Ø9.5 - 10.0	Ø9.0 - 9.4	Ø10 h6	2.0 - 2.5	4.0 - 6.0	90
Example: Torx® mill; type 25, 10 cutting edges; straight with equal flute spacing and α-INOX coated							
AM.EX.T25.038.092.446.318.10.01.ZG.G	T25	9.8	9.4	Ø10 h6	2.4	5.0	90

Minimum order quantity: 5 pieces | Delivery time: Blank 2 weeks; Coated 3-4 weeks

Torx® T25 D_1= 9.5mm - 10.0mm

Torx® Go gauge - standard dimensions per ISO 10664 (mean value)				
Torx®	ØDA	ØDB	Rx	Ry
25	4.46	3.18	0.38	0.92
30	5.55	3.96	0.45	1.19





Article number

(AM.EX.T25.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT): _____

☐ **Inquiry**

☐ **Order** **Order number:** _____ **Other:** _____

Dimensions (XXX.YYY.AAA.BBB):

D_1 Ø9.5-Ø10.0 _____ D_2 Ø9.0-Ø9.4 _____ R_x (XXX) _____

D_A (AAA) _____ L_1 2.0-2.5 mm _____ R_y (YYY) _____

D_B (BBB) _____ L_2 4.0-6.0 mm _____ Z _____

Material to be machined _____

Coating (BE):

☐ (.00) blank
☐ (.01) α-INOX
☐ (.02) β-Titan
☐ (.03) γ-Steel

Flute form (ZF):

☐ (.ZG) Straight
☐ (.ZD) Helical

Product attributes:

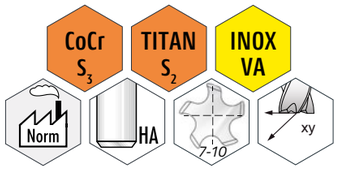
- Shank shape: HA
- Shank diameter D3h6: Ø10
- Raw material: R_HB.100.900.h6
- Overall length: 90
- Amount of flutes: Z7-10

Minimum order quantity from 5 pieces: _____

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

ØDA AAA	ØDB BBB	Rx XXX	Ry YYY	No. of flutes (Z)	Coating (BE)				Flute form (ZF)		Flute spacing (ZT)	
					blank .00	α-INOX .01	β-Titan .02	γ-Steel .03	.ZG	.ZD	.G	.U
4.46	3.18	0.38	0.92	10	.01 (α-INOX)				.ZD (Z-Helix)		.G (even)	

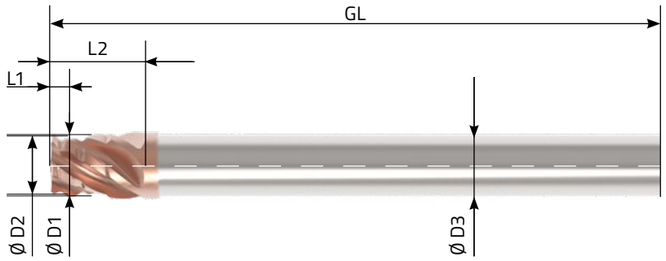
Torx® T30



ACTIONMILL | Torx® type | Ø-DA | Amount of flutes Blank or coated

AM.EX.T30.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT ← Flute pitch

Extern Starlobe | Rx | Ry | Ø-DB | Flute form



5 PRO's of the ACTIONMILL:

- Quickly available, semi-standardized external Torx® mill
- For milling Torx® type T30 according to ISO10664 or customized
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

Article number XXX.YYY.AAA.BBB	"Torx®" type	D1 (mm)	D2 (mm)	D3 h6 (mm)	L1 (mm)	L2 (mm)	GL (mm)
AM.EX.T30.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT	T30	Ø9.5 - 10.0	Ø9.0 - 9.4	Ø10 h6	2.0 - 2.5	4.0 - 6.0	90

Example: Torx® mill; type 30, 7 cutting edges; helical with unequal flute spacing and uncoated

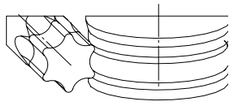
AM.EX.T30.045.119.555.396.7.00.ZD.U	T30	9.8	9.4	Ø10 h6	2.3	5.5	90

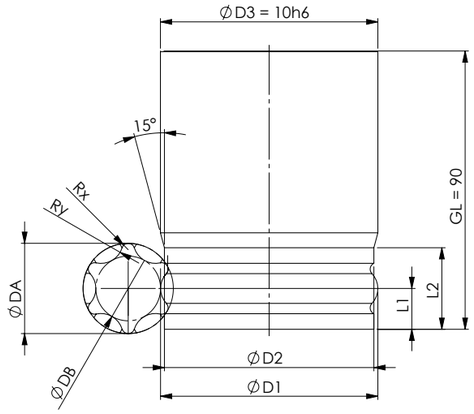
Minimum order quantity: 5 pieces

Delivery time: Blank 2 weeks; Coated 3-4 weeks

Torx® T30 D_1= 9.5mm - 10.0mm

Torx® Go gauge - standard dimensions per ISO 10664 (mean value)				
Torx®	ØDA	ØDB	Rx	Ry
25	4.46	3.18	0.38	0.92
30	5.55	3.96	0.45	1.19





Article number

(AM.EX.T30.XXX.YYY.AAA.BBB.Z.BE.ZF.ZT): _____

☐ **Inquiry**

☐ **Order** **Order number:** _____ **Other:** _____

Dimensions (XXX.YYY.AAA.BBB):

D_1 Ø9.5-Ø10.0 _____ D_2 Ø9.0-Ø9.4 _____ R_x (XXX) _____

D_A (AAA) _____ L_1 2.0-2.5 mm _____ R_y (YYY) _____

D_B (BBB) _____ L_2 4.0-6.0 mm _____ Z _____

Material to be machined _____

Coating (BE):

☐ (.00) blank

☐ (.01) α-INOX

☐ (.02) β-Titan

☐ (.03) γ-Steel

Flute form (ZF):

☐ (.ZG) Straight

☐ (.ZD) Helical

Product attributes:

- Shank shape: HA
- Shank diameter D3h6: Ø10
- Raw material: R_HB.100.900.h6
- Overall length: 90
- Amount of flutes: Z7-10

Minimum order quantity from 5 pieces: _____

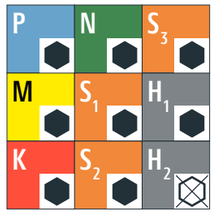
* Without further information, the most suitable coating will be used.

ØDA AAA	ØDB BBB	Rx XXX	Ry YYY	No. of flutes (Z)	Coating (BE)				Flute form (ZF)		Flute spacing (ZT)	
					blank .00	α-INOX .01	β-Titan .02	γ-Steel .03	.ZG	.ZD	.G	.U
				Z7 – Z10								
5.55	3.96	0.45	1.19	7	.00 (blank)				.ZD (Z-Helix)		.U (Unequal)	

HB microtec ACTIONTOOLS & ENGINEERING

ACTIONMILL® by HB microtec

Extern Starlobe



Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
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
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

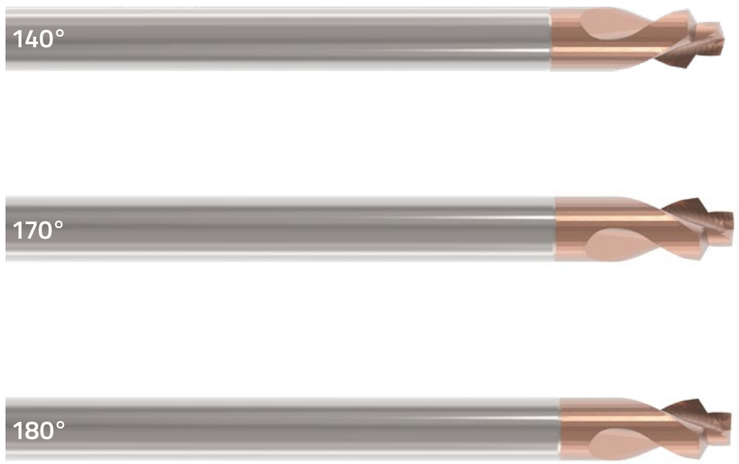
Recommended use | ⬢ Highly suitable | ⬡ Partially suitable | ⊠ Not recommended

T4-T7		T8-T10		T15-T20		T20-T30	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
50-80	0.008-0.018	50-100	0.008-0.022	60-120	0.010-0.025	60-140	0.010-0.03
20-50	0.006-0.013	30-70	0.006-0.020	30-80	0.008-0.022	30-80	0.008-0.025

ACTIONDRILL®
by HB microtec
INOX-8xD cooled

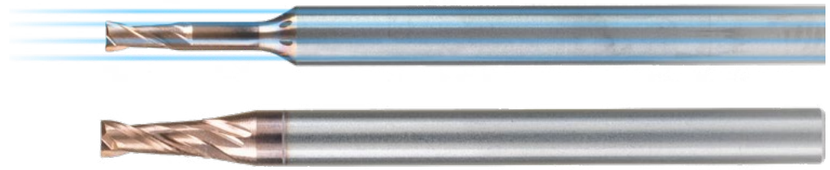
TARGETDRILL®
by HB microtec
micro-INOX 8xD

ACTIONDRILL®
by HB microtec
Intern Starlobe



ACTIONMILL®
by HB microtec
INOX-micro cooled

TARGETMILL®
by HB microtec
INOX-micro



ACTIONMILL®
by HB microtec
Intern Starlobe

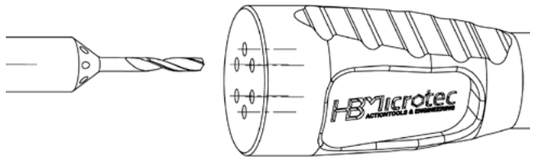
5 PRO's of the ACTIONMILL:

- Quickly available, standardized internal Torx® mills & drills
- For machining Torx® types from T4 to T30
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

With pre-drilling of the lobes, e.g. for CoCr

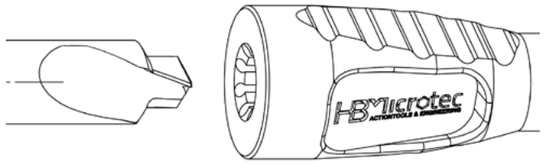
CoCr S_3

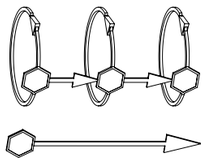
Pre-drilling the lobes



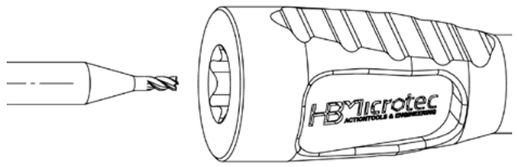
Pre-drilling with 120° chamfer

Point angle 140°/
170° or 180°

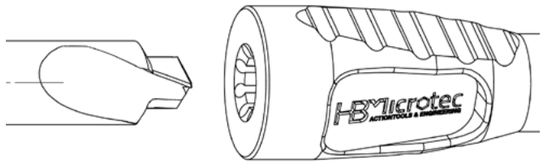




Dynamic wall milling
Spiral interpolation



Deburring

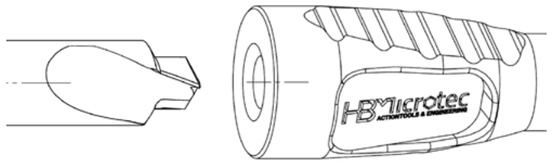


Without pre-drilling of the lobes, e.g. for titanium & INOX

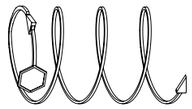
TITAN S_2 INOX VA

Pre-drilling with 120° chamfer

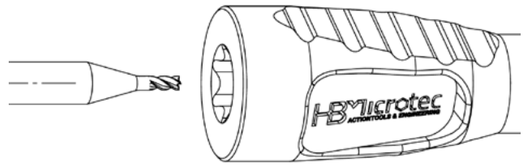
Point angle 140°/
170° or 180°



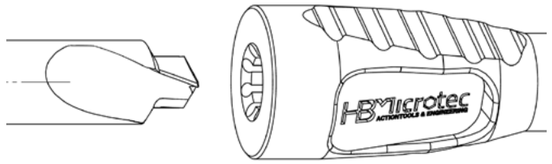
Pre-drilling with 120° chamfer



Dynamic wall milling
Spiral interpolation



Deburring



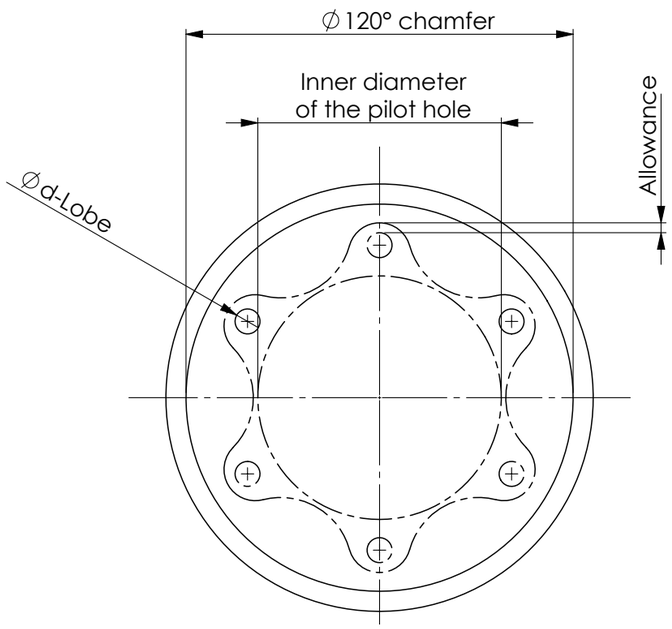
Tool recommendation for internal Torx®

With pre-drilling of the lobes for internal Torx®

CoCr S_3 | TITAN S_2 | INOX VA

Dimensions according to ISO 10664

Torx® Type	D-Lobe [mm]	Allowance [mm]	Drilling the lobes with internal cooling	Drilling the lobes with external cooling	Pre-drilling 140° point angle	Milling the lobes 3xD	Milling the lobes 5xD
T4	0.25	0.02	AD.025.140.IK.8D	TD.MI.025.8D	AD.IT.120.090.140	AM.IT.020.060.3D	AM.IT.020.100.5D
T5	0.25	0.05	AD.025.140.IK.8D	TD.MI.025.8D	AD.IT.120.100.140	AM.IT.025.075.3D	AM.IT.025.125.5D
T6	0.30	0.05	AD.030.140.IK.8D	TD.MI.030.8D	AD.IT.120.120.140	AM.IT.030.090.3D	AM.IT.030.150.5D
T7	0.35	0.07	AD.035.140.IK.8D	TD.MI.035.8D	AD.IT.120.140.140	AM.IT.030.090.3D	AM.IT.030.150.5D
T8	0.40	0.08	AD.040.140.IK.8D	TD.MI.040.8D	AD.IT.120.160.140	AM.IT.040.120.3D	AM.IT.040.200.5D
T10	0.50	0.06	AD.050.140.IK.8D	TD.MI.050.8D	AD.IT.120.190.140	AM.IT.050.150.3D	AM.IT.050.250.5D
T15	0.60	0.07	AD.060.140.IK.8D	TD.MI.060.8D	AD.IT.120.230.140	AM.IT.050.150.3D	AM.IT.050.250.5D
T20	0.70	0.09	AD.070.140.IK.8D	TD.MI.070.8D	AD.IT.120.270.140	AM.IT.050.150.3D	AM.IT.060.300.5D
T25	0.80	0.10	AD.080.140.IK.8D	TD.MI.080.8D	AD.IT.120.310.140	AM.IT.080.240.3D	AM.IT.080.400.5D
T30	1.00	0.12	AD.100.140.IK.8D	TD.MI.100.8D	AD.IT.120.380.140	AM.IT.100.300.3D	AM.IT.100.500.5D

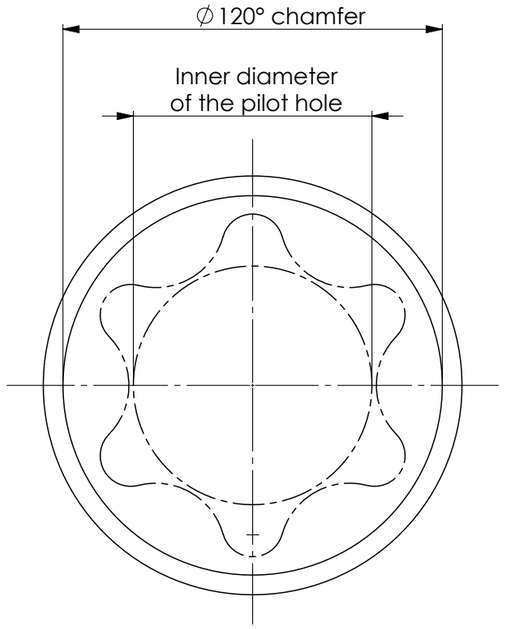


Without pre-drilling the lobes for internal Torx®

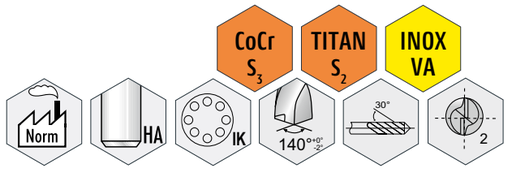
TITAN S_2 | INOX VA

Dimensions according to ISO 10664

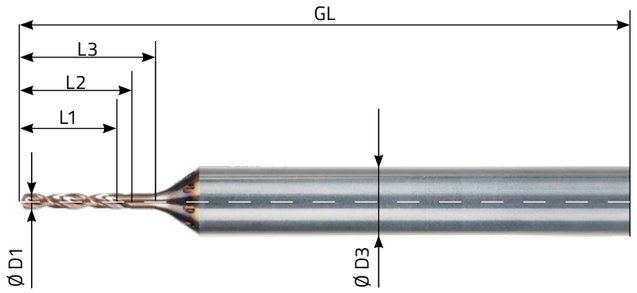
Torx® Type	Pre-drilling 140°/170°/180° point angle	Milling the lobes 3xD	Milling the lobes 5xD
T4	AD.IT.4.090.056.XXX	AM.IT.020.060.3D	AM.IT.020.100.5D
T5	AD.IT.5.100.072.XXX	AM.IT.025.075.3D	AM.IT.025.125.5D
T5	AD.IT.5.100.059.XXX	AM.IT.025.075.3D	AM.IT.025.125.5D
T6	AD.IT.6.120.088.XXX	AM.IT.030.090.3D	AM.IT.030.150.5D
T6	AD.IT.6.120.067.XXX	AM.IT.030.090.3D	AM.IT.030.150.5D
T7	AD.IT.7.140.083.XXX	AM.IT.030.090.3D	AM.IT.030.150.5D
T7	AD.IT.7.140.079.XXX	AM.IT.030.090.3D	AM.IT.030.150.5D
T8	AD.IT.8.160.115.XXX	AM.IT.040.120.3D	AM.IT.040.200.5D
T8	AD.IT.8.160.081.XXX	AM.IT.040.120.3D	AM.IT.040.200.5D
T10	AD.IT.10.190.113.XXX	AM.IT.050.150.3D	AM.IT.050.250.5D
T15	AD.IT.15.230.142.XXX	AM.IT.050.150.3D	AM.IT.050.250.5D
T20	AD.IT.20.270.170.XXX	AM.IT.050.150.3D	AM.IT.060.300.5D
T25	AD.IT.25.310.236.XXX	AM.IT.080.240.3D	AM.IT.080.400.5D
T30	AD.IT.30.380.293.XXX	AM.IT.100.300.3D	AM.IT.100.500.5D
T30	AD.IT.30.380.245.XXX	AM.IT.100.300.3D	AM.IT.100.500.5D



INOX-8xD cooled



ACTIONDRILL — Integrated cooling
AD.030.140.IK.8D ← 8xD drilling depth
D1: Ø 0.3 mm — 140° Point angle



- α-INOX coated

5 PRO's of the ACTIONDRILL:

- 8xD "micro" drill with integrated cooling from Ø 0.25

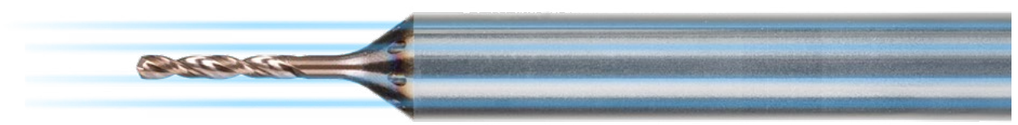
Matched to our INOX-3xD Pilot cooled

- Perfect positional accuracy
- Shorter process times and high process reliability
- Long chips are flushed out through the integrated cooling

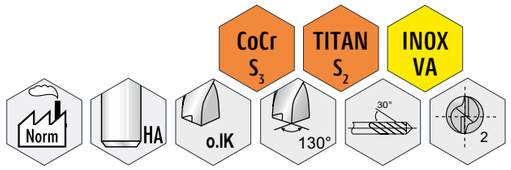
channels without retracting

Article number	D1 k5 (mm)	D1 (inch)	D3 h5 (mm)	L1 (8xD1 / mm)	L2 (9xD1 / mm)	L3 (10xD1 / mm)	GL (mm)
AD.025.140.IK.8D	Ø 0.250	-	Ø 4.00	2.00	2.25	2.50	40.00
AD.030.140.IK.8D	Ø 0.300	-	Ø 4.00	2.40	2.70	3.00	40.00
AD.035.140.IK.8D	Ø 0.350	-	Ø 4.00	2.80	3.15	3.50	40.00
AD.040.140.IK.8D	Ø 0.400	-	Ø 4.00	3.20	3.60	4.00	40.00
AD.050.140.IK.8D	Ø 0.500	-	Ø 4.00	4.00	4.50	5.00	40.00
AD.060.140.IK.8D	Ø 0.600	-	Ø 4.00	4.80	5.40	6.00	40.00
AD.070.140.IK.8D	Ø 0.700	-	Ø 4.00	5.60	6.30	7.00	40.00
AD.080.140.IK.8D	Ø 0.800	-	Ø 4.00	6.40	7.20	8.00	40.00
AD.100.140.IK.8D	Ø 1.000	-	Ø 4.00	8.00	9.00	10.00	50.00

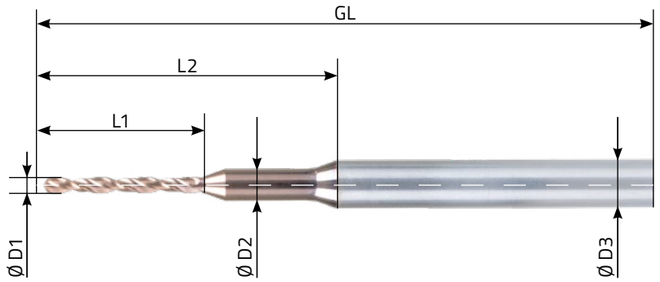
Available from stock

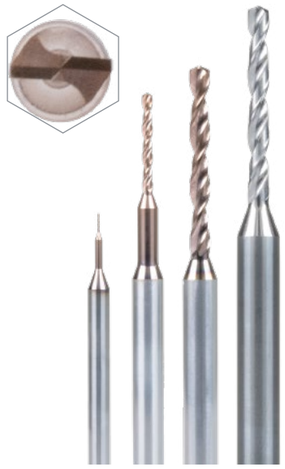


VHM micro-INOX 8xD



TARGETDRILL micro-INOX
TD.MI.010.8D(.01) ← α-INOX coating
D1: Ø 0.10 mm 8xD





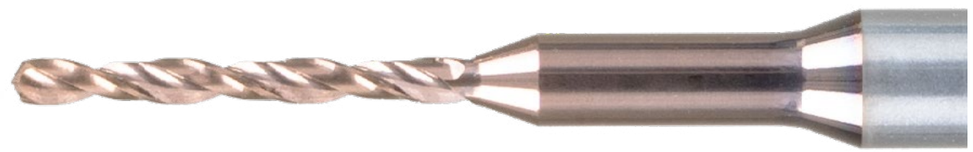
- α-INOX coated with suffix .01 or blank
- D1 +0/-0.004 blank & D1 +0/-0.002 coated

5 PRO's of the TARGETDRILL:

- From Ø 0.1 to Ø 2.05 in 0.01 mm increments, available from stock
- 8xD micro-INOX drill
- Reinforced shank
- Available coated and uncoated
- Excellent price-performance ratio

Article number	α-INOX	D1 (mm)	D2 (mm)	D3 h5 (mm)	L1 (mm)	L2 (mm)	GL (mm)
TD.MI.025.8D	.01	Ø 0.25	Ø 1.00	Ø 3.00	2.00	7.00	39.00
TD.MI.030.8D	.01	Ø 0.30	Ø 1.00	Ø 3.00	2.40	7.00	39.00
TD.MI.035.8D	.01	Ø 0.35	Ø 1.00	Ø 3.00	2.80	7.00	39.00
TD.MI.040.8D	.01	Ø 0.40	Ø 1.00	Ø 3.00	3.20	7.00	39.00
TD.MI.050.8D	.01	Ø 0.50	Ø 1.00	Ø 3.00	4.00	15.00	39.00
TD.MI.060.8D	.01	Ø 0.60	Ø 1.00	Ø 3.00	4.80	15.00	39.00
TD.MI.070.8D	.01	Ø 0.70	Ø 1.50	Ø 3.00	5.60	15.00	39.00
TD.MI.080.8D	.01	Ø 0.80	Ø 1.50	Ø 3.00	6.40	15.00	39.00
TD.MI.100.8D	.01	Ø 1.00	Ø 1.50	Ø 3.00	8.00	15.00	39.00

Available from stock



HB microtec ACTIONTOOLS & ENGINEERING

ACTIONDRILL® by HB microtec INOX-8xD cooled

P	N	S_3
M	S_1	H_1
K	S_2	H_2

Recommended use | ● Highly suitable | ○ Partially suitable | ⊠ Not recommended

Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
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
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

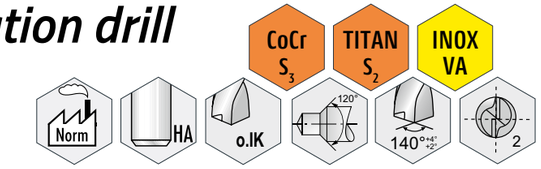
Ø 0.25 - 0.4 mm		Ø 0.5 - 0.8 mm		Ø 1.0 - 1.2 mm		Ø 1.5 - 2.0 mm	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
50-100	0.08 - 0.01	50-100	0.009 - 0.016	50-120	0.025 - 0.04	50-120	0.040 - 0.080
50-80	0.08 - 0.01	50-80	0.008 - 0.020	50-80	0.02 - 0.038	50-90	0.040 - 0.070
15 - 50	0.08 - 0.01	15 - 50	0.025 - 0.045	15 - 50	0.025 - 0.045	15 - 60	0.060 - 0.092
15 - 50	0.08 - 0.01	15 - 50	0.025 - 0.045	15 - 50	0.025 - 0.045	15 - 60	0.060 - 0.120
15 - 50	0.08 - 0.01	15 - 50	0.020 - 0.024	15 - 50	0.020 - 0.024	15 - 50	0.055 - 0.092

TARGETDRILL® by HB microtec micro-INOX

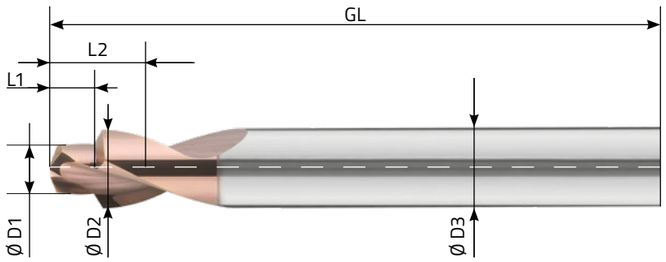
Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C
		1.4542	X5CrNiCuNb 16-4	AISI 630 / ASTM 17-4 PH
		1.4545	X5CrNiCuNb 15-5	ASTM 15-5 PH
		1.4301	X5CrNi 18-10	AISI 304
		1.4435	X2CrNiMo 18-14-3	AISI 316L
S (S1, S2, 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

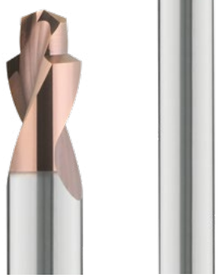
Ø 0.1 - 0.5 mm		Ø 0.5 - 1.0 mm		Ø 1.0 - 1.2 mm		Ø 1.5 - 2.05 mm	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
30-100	0.004 - 0.01	30-100	0.009 - 0.016	40-120	0.015 - 0.04	40-120	0.020 - 0.080
30-80	0.004 - 0.01	30-80	0.008 - 0.020	40-80	0.014 - 0.038	40-80	0.020 - 0.070
15 - 50	0.007 - 0.01	15 - 50	0.008 - 0.045	15 - 50	0.015 - 0.045	15 - 50	0.040 - 0.092
15 - 50	0.007 - 0.01	15 - 50	0.008 - 0.045	15 - 50	0.015 - 0.045	15 - 50	0.040 - 0.120
15 - 50	0.007 - 0.01	15 - 50	0.008 - 0.024	15 - 50	0.01 - 0.024	15 - 50	0.035 - 0.092

Micro 140° combination drill for Torx®



ACTIONDRILL — D1: Ø 0.90 mm
AD.IT.120.090.140 ← 140° Point angle
Intern Starlobe — 120° Step angle



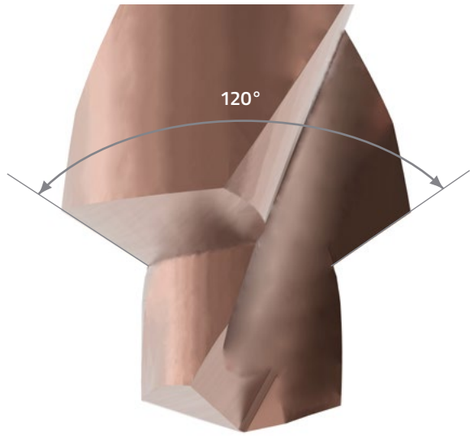


5 PRO's of the ACTIONMILL:

- Combination tool: centering + drilling + 120° chamfering
- For pre-drilling Torx® types from T4 to T30
- Minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

Article number	"Torx®" Starlobe	D1 ±0.01	D2 ±0.01	D3 h5	L1 ±0.01	GL 0/+2 (mm)
AD.IT.120.090.140	T4	Ø 0.90	Ø 2.20	Ø 3.00	0.54	39.00
AD.IT.120.100.140	T5	Ø 1.00	Ø 2.20	Ø 3.00	0.70	39.00
AD.IT.120.120.140	T6	Ø 1.20	Ø 2.30	Ø 3.00	0.84	39.00
AD.IT.120.140.140	T7	Ø 1.40	Ø 3.00	Ø 3.00	0.80	39.00
AD.IT.120.160.140	T8	Ø 1.60	Ø 3.00	Ø 3.00	1.12	39.00
AD.IT.120.190.140	T10	Ø 1.90	Ø 4.00	Ø 4.00	1.07	50.00
AD.IT.120.230.140	T15	Ø 2.30	Ø 4.00	Ø 4.00	1.38	50.00
AD.IT.120.270.140	T20	Ø 2.70	Ø 5.00	Ø 6.00	1.66	50.00
AD.IT.120.310.140	T25	Ø 3.10	Ø 6.00	Ø 6.00	2.28	50.00
AD.IT.120.380.140	T30	Ø 3.80	Ø 6.00	Ø 6.00	2.83	50.00

Available from stock



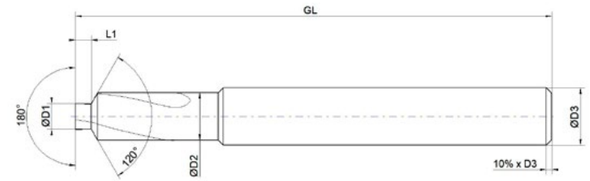
Torx® pilot drill dimensions according to ISO 10664

Inox M | Ti S_2 | CoCr S_3

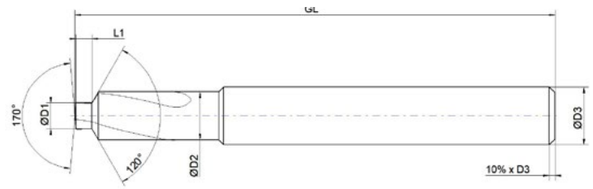
Internal Torx® pilot drill 180° or 170° or 140°							Point angle please tick		
Article number	Torx® Type	D1 0/- 0.008 [mm]	D2 (mm)	D3 h6 [mm]	L1 (mm)	GL (mm)	140°	170°	180°
AD.IT.4.090.056.XXX	T4	Ø 0.90	Ø 1.70	Ø 3.00	0.56	40.00	☐	☐	☐
AD.IT.5.100.072.XXX	T5	Ø 1.00	Ø 2.00	Ø 3.00	0.72	40.00	☐	☐	☐
AD.IT.5.100.059.XXX	T5	Ø 1.00	Ø 2.00	Ø 3.00	0.59	40.00	☐	☐	☐
AD.IT.6.120.088.XXX	T6	Ø 1.20	Ø 2.20	Ø 3.00	0.88	40.00	☐	☐	☐
AD.IT.6.120.067.XXX	T6	Ø 1.20	Ø 2.20	Ø 3.00	0.67	40.00	☐	☐	☐
AD.IT.7.140.083.XXX	T7	Ø 1.40	Ø 3.00	Ø 3.00	0.83	40.00	☐	☐	☐
AD.IT.7.140.079.XXX	T7	Ø 1.40	Ø 3.00	Ø 3.00	0.79	40.00	☐	☐	☐
AD.IT.8.160.115.XXX	T8	Ø 1.60	Ø 3.00	Ø 3.00	1.15	40.00	☐	☐	☐
AD.IT.8.160.081.XXX	T8	Ø 1.60	Ø 3.00	Ø 3.00	0.81	40.00	☐	☐	☐
AD.IT.10.190.113.XXX	T10	Ø 1.90	Ø 4.00	Ø 4.00	1.13	50.00	☐	☐	☐
AD.IT.15.230.142.XXX	T15	Ø 2.30	Ø 4.00	Ø 4.00	1.42	50.00	☐	☐	☐
AD.IT.20.270.170.XXX	T20	Ø 2.70	Ø 5.00	Ø 6.00	1.7	50.00	☐	☐	☐
AD.IT.25.310.236.XXX	T25	Ø 3.10	Ø 6.00	Ø 6.00	2.36	50.00	☐	☐	☐
AD.IT.30.380.293.XXX	T30	Ø 3.80	Ø 6.00	Ø 6.00	2.93	50.00	☐	☐	☐
AD.IT.30.380.245.XXX	T30	Ø 3.80	Ø 6.00	Ø 6.00	2.45	50.00	☐	☐	☐

Available in 2-4 weeks.

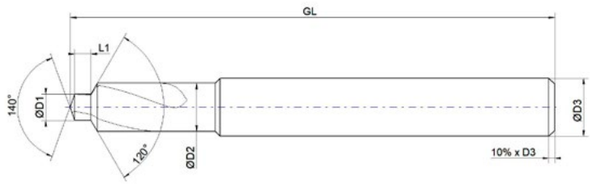
01 α-INOX coated for stainless steels ferritic, martensitic, austenitic & heat-resistant steels, titanium alloys, CrCo (M&S)



Drill point angle 180°

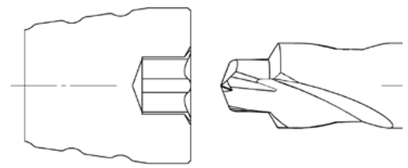


Drill point angle 170°

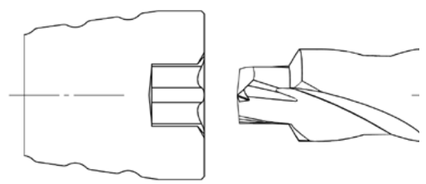


Drill bit point angle 140°

Pre-drilling the Torx® with 120° chamfer angle



Point angle 140°



Point angle 180° or 170°

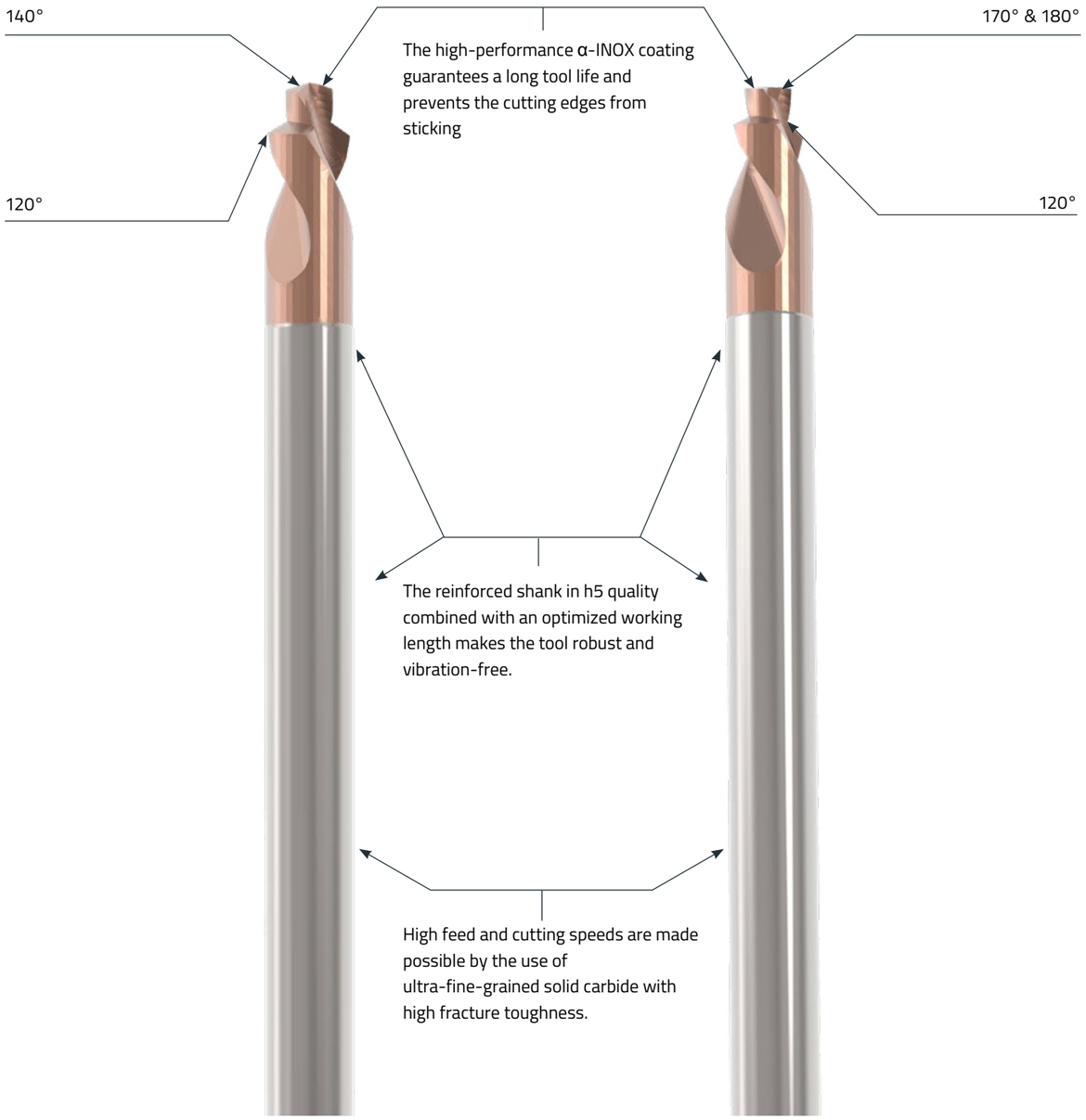
With a 170° point angle, drilling can be up to 4x faster than with 180°, if the geometry allows it!

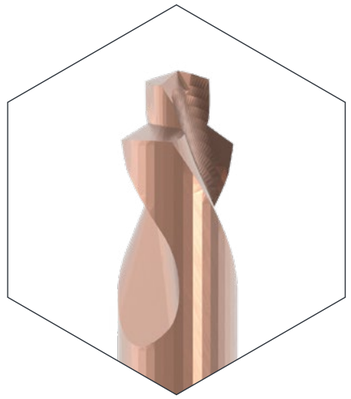
Intern Starlobe 140°

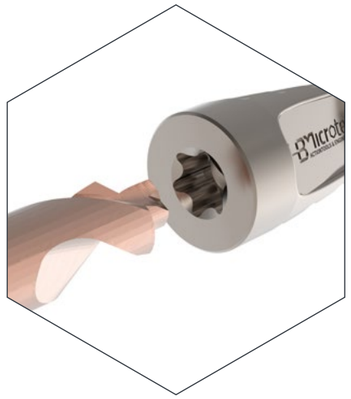
from Ø 0.9 mm
to Ø 3.8 mm

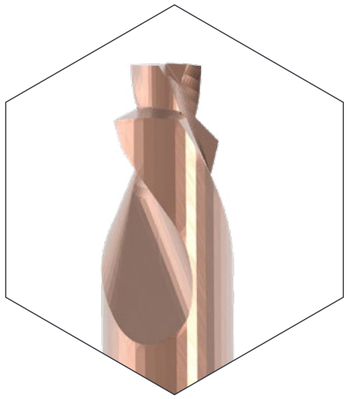
Intern Starlobe 170° & 180°

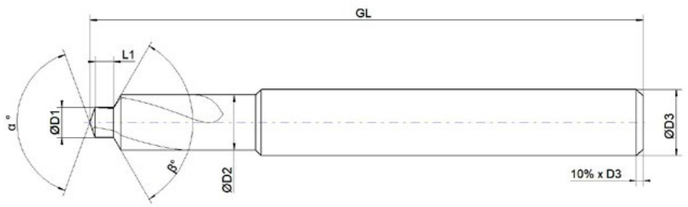
from Ø 0.9 mm
to Ø 3.8 mm











☐ **Inquiry** **Article number :** _____

☐ **Order** **Order number:** _____ **Other:** _____

Dimensions (XXX.YYY.AAA.BBB):	**Coating (BE):**	**Contact person:**
D_1 _____ GL _____ α: _____	☐ (.00) blank	_____
D_2 _____ L_1 _____ β: _____	☐ (.01) α-INOX	
D_3 _____	☐ (.02) β-Titan	
	☐ (.03) γ-Steel	
Material to be machined _____		
Date, signature & company stamp	**Minimum order quantity from 5 pieces:**	
_____	_____	

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

Cutting data - 140° / 170° / 180°

HB microtec ACTIONTOOLS & ENGINEERING

ACTIONDRILL® by HB microtec

Intern Starlobe

P	N	S_3
M	S_1	H_1
K	S_2	H_2

Recommended use | ● Highly suitable | ○ Partially suitable | ⊠ Not recommended

140°

Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS	T4-T8 vc [m/min]	T4-T8 fz [mm]	T10-T15 vc [m/min]	T10-T15 fz [mm]	T20-T30 vc [m/min]	T20-T30 fz [mm]
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C	20-30	0.020-0.035	20-30	0.040-0.060	20-30	0.060-0.080
		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						
S (S1, S2, S3)	Heat-resistant steels, titanium, CrCo	2.4617	NiMo28	Hastelloy B-2	20-30	0.010-0.020	20-30	0.020-0.030	20-30	0.030-0.060
		2.4665	NiCr22Fe18Mo	Hastelloy X						
		3.7165	TiAl6V4	ASTM B348 / F136						
		9.9367	TiAl6Nb7	ASTM F1295						
		2.4964	CoCr20W15Ni	Haynes 25						
			CrCoMo28	ASTM F1537						

170°

Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS	T4-T8 vc [m/min]	T4-T8 fz [mm]	T10-T15 vc [m/min]	T10-T15 fz [mm]	T20-T30 vc [m/min]	T20-T30 fz [mm]
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C	20-30	0.015-0.025	20-30	0.020-0.040	20-30	0.025-0.050
		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						
S (S1, S2, S3)	Heat-resistant steels, titanium, CrCo	2.4617	NiMo28	Hastelloy B-2	20-30	0.006-0.010	20-30	0.010-0.020	20-30	0.014-0.035
		2.4665	NiCr22Fe18Mo	Hastelloy X						
		3.7165	TiAl6V4	ASTM B348 / F136						
		9.9367	TiAl6Nb7	ASTM F1295						
		2.4964	CoCr20W15Ni	Haynes 25						
			CrCoMo28	ASTM F1537						

180°

Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS	T4-T8 vc [m/min]	T4-T8 fz [mm]	T10-T15 vc [m/min]	T10-T15 fz [mm]	T20-T30 vc [m/min]	T20-T30 fz [mm]
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C	20-30	0.013-0.020	20-30	0.015-0.025	20-30	0.020-0.040
		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						
S (S1, S2, S3)	Heat-resistant steels, titanium, CrCo	2.4617	NiMo28	Hastelloy B-2	20-30	0.004-0.010	20-30	0.008-0.012	20-30	0.012-0.018
		2.4665	NiCr22Fe18Mo	Hastelloy X						
		3.7165	TiAl6V4	ASTM B348 / F136						
		9.9367	TiAl6Nb7	ASTM F1295						
		2.4964	CoCr20W15Ni	Haynes 25						
			CrCoMo28	ASTM F1537						

INOX-micro Torx® 3xD

from Ø 0.2 mm
to Ø 1.0 mm

INOX-micro Torx® 5xD

from Ø 0.2 mm
to Ø 1.0 mm

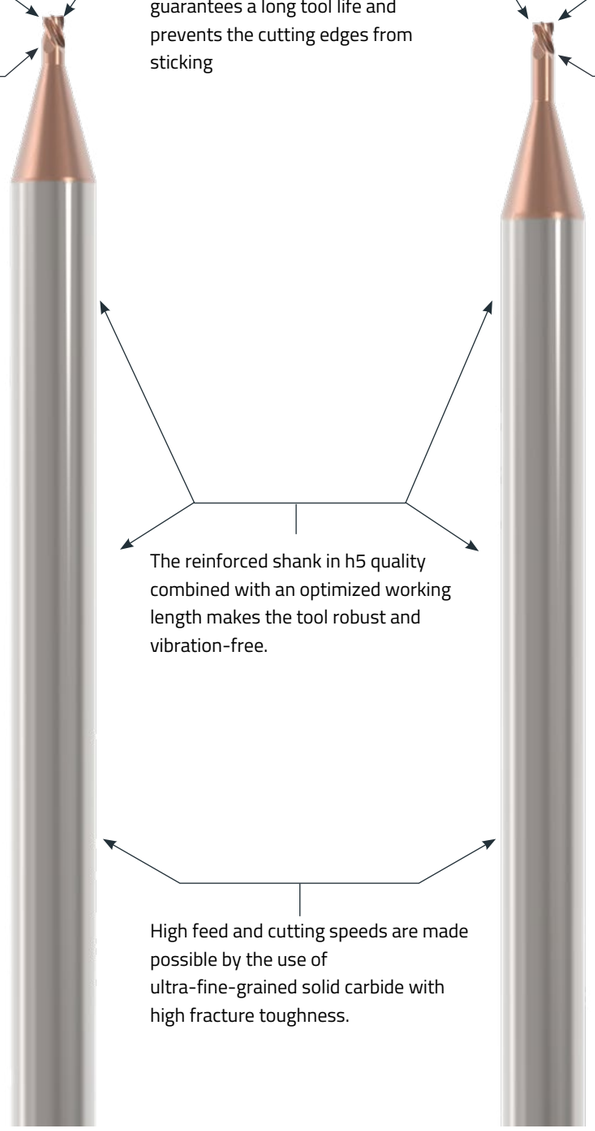
Z3-4 - Sharp

3xD Neck length

The high-performance α-INOX coating guarantees a long tool life and prevents the cutting edges from sticking

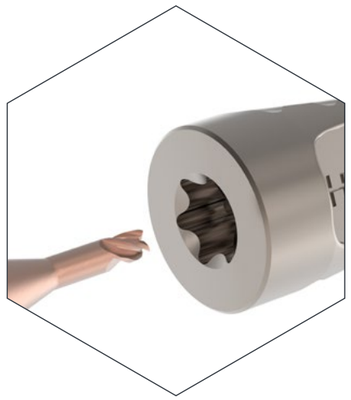
Z3-4 - Sharp

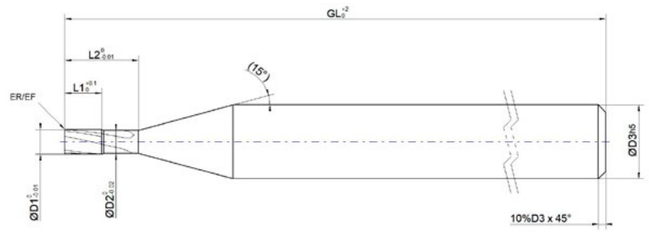
5xD Neck length



The reinforced shank in h5 quality combined with an optimized working length makes the tool robust and vibration-free.

High feed and cutting speeds are made possible by the use of ultra-fine-grained solid carbide with high fracture toughness.



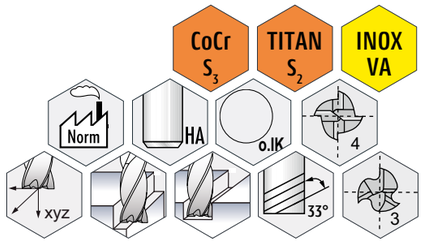


☐ **Order** **Order number:** _____ ☐ **Inquiry**

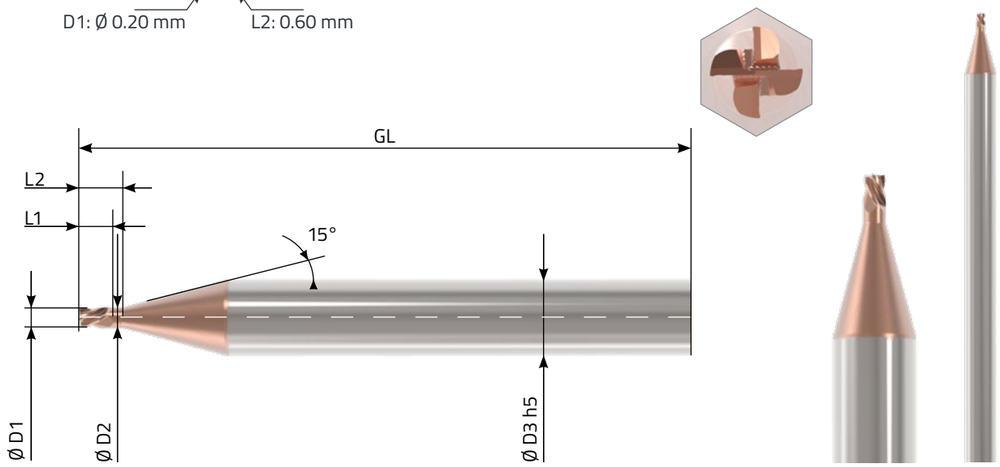
Dimensions:	**Coating:**	**Cutting direction:**
D_1: _____ GL: _____ EF: _____ D_2: _____ L_1: _____ ER: _____ D_3: _____ L_2: _____ Z: _____	☐ Coated*: _____ ☐ Uncoated	☐ Left ☐ Right
Material to be machined:	**Shank shape:**	**Quantity:**
Date, signature & company stamp:		**Contact person:**

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

3xD micro Torx® mill



ACTIONMILL — Intern Starlobe
AM.IT.020.060.3D ← 3xD Neck length
D1: Ø 0.20 mm — L2: 0.60 mm



- α-INOX coated

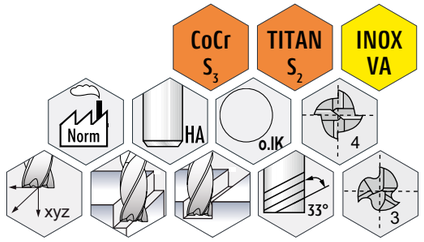
5 PRO's of the ACTIONMILL:

- Micro mill from Ø0.2 with Z3 from Ø0.4 with Z4
- For milling Torx® types from T4 to T30
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

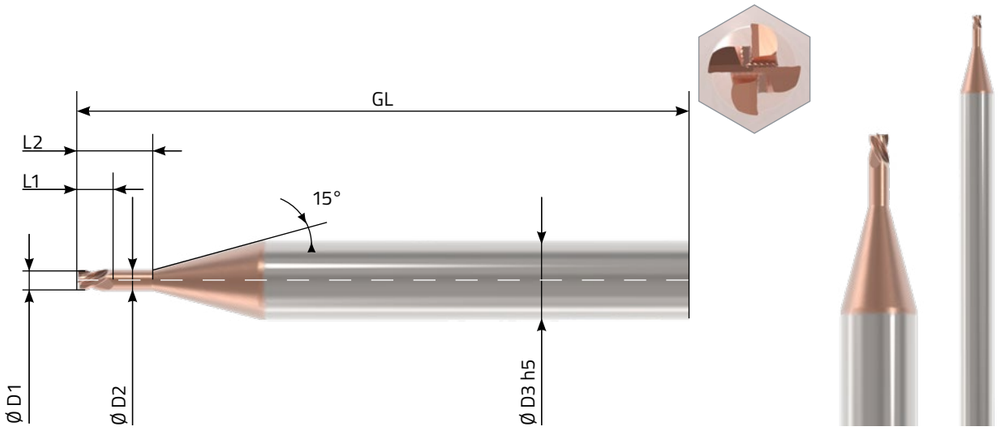
Article number	"Torx®" Starlobe	D1 0/-0.01	D2 0/-0.02	D3 h5	L1 0/+0.1	L2 0/-0.01	GL (mm)	No. of flutes
AM.IT.020.060.3D	T4	Ø 0.20	Ø 0.18	Ø 3.00	0.30	0.60	39.00	3
AM.IT.025.075.3D	T5	Ø 0.25	Ø 0.24	Ø 3.00	0.38	0.75	39.00	3
AM.IT.030.090.3D	T6/T7	Ø 0.30	Ø 0.28	Ø 3.00	0.45	0.90	39.00	3
AM.IT.040.120.3D	T8/T10	Ø 0.40	Ø 0.38	Ø 3.00	0.60	1.20	39.00	4
AM.IT.050.150.3D	T10/T15	Ø 0.50	Ø 0.47	Ø 3.00	0.75	1.50	39.00	4
AM.IT.060.180.3D	T20	Ø 0.60	Ø 0.56	Ø 3.00	0.90	1.80	39.00	4
AM.IT.080.240.3D	T25	Ø 0.80	Ø 0.75	Ø 3.00	1.20	2.40	39.00	4
AM.IT.100.300.3D	T30	Ø 1.00	Ø 0.94	Ø 3.00	1.50	3.00	39.00	4

Available from stock

5xD micro Torx® mill



ACTIONMILL Intern Starlobe
AM.IT.020.100.5D ← 5xD Neck length
D1: Ø 0.20 mm L2: 1.00 mm



- α-INOX coated

5 PRO's of the ACTIONMILL:

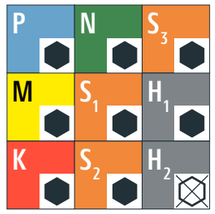
- Micro mill from Ø0.2 with Z3 from Ø0.4 with Z4
- For milling Torx® types from T4 to T30
- High profile accuracy & minimal burr formation
- Shorter process times and high process reliability
- Chrome-free coating prevents cross-contamination with medical parts

Article number	"Torx®" Starlobe	D1 0/-0.01	D2 0/-0.02	D3 h5	L1 0/+0.1	L2 0/-0.01	GL (mm)	No. of flutes
AM.IT.020.100.5D	T4	Ø 0.20	Ø 0.18	Ø 3.00	0.30	1.00	39.00	3
AM.IT.025.125.5D	T5	Ø 0.25	Ø 0.24	Ø 3.00	0.38	1.25	39.00	3
AM.IT.030.150.5D	T6/T7	Ø 0.30	Ø 0.28	Ø 3.00	0.45	1.50	39.00	3
AM.IT.040.200.5D	T8/T10	Ø 0.40	Ø 0.38	Ø 3.00	0.60	2.00	39.00	4
AM.IT.050.250.5D	T10/T15	Ø 0.50	Ø 0.47	Ø 3.00	0.75	2.50	39.00	4
AM.IT.060.300.5D	T20	Ø 0.60	Ø 0.56	Ø 3.00	0.90	3.00	39.00	4
AM.IT.080.400.5D	T25	Ø 0.80	Ø 0.75	Ø 3.00	1.20	4.00	39.00	4
AM.IT.100.500.5D	T30	Ø 1.00	Ø 0.94	Ø 3.00	1.50	5.00	39.00	4

Available from stock

ACTIONMILL® by HB microtec

INOX-micro Torx®



Recommended use ⬢ Highly suitable ⬡ Partially suitable ⊠ Not recommended

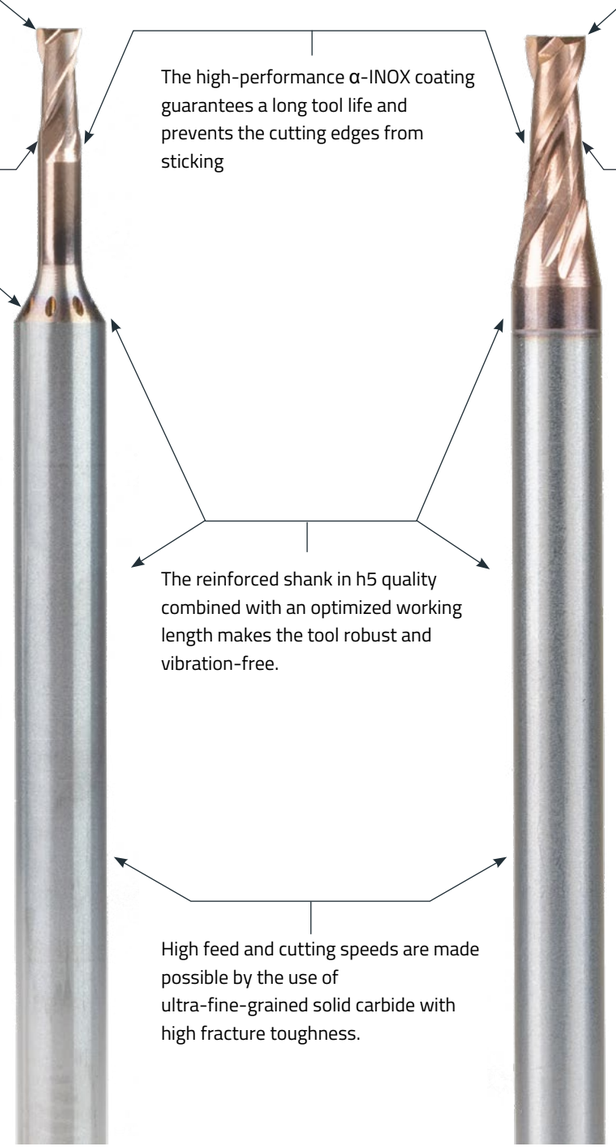
Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS	T4-T7 vc [m/min]	T4-T7 fz [mm]	T8-T15 vc [m/min]	T8-T15 fz [mm]	T20-T30 vc [m/min]	T20-T30 fz [mm]
M	Stainless steels: ferritic, martensitic, austenitic	1.4034	X46Cr13	AISI 420C	30-50	0.001-0.003	40-70	0.003-0.006	60-100	0.006-0.010
		1.4542	X5CrNiCuNb 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						
S (S1, S2, S3)	Heat-resistant steels, titanium, CrCo	2.4617	NiMo28	Hastelloy B-2	30-50	0.003-0.006	40-70	0.008-0.015	60-100	0.015-0.03
		2.4665	NiCr22Fe18Mo	Hastelloy X	30-50	0.001-0.003	40-70	0.008-0.015	60-100	0.015-0.03
		3.7165	TiAl6V4	ASTM B348 / F136	30-50	0.001-0.003	40-70	0.008-0.015	60-100	0.015-0.03
		9.9367	TiAl6Nb7	ASTM F1295						
		2.4964	CoCr20W15Ni	Haynes 25						
			CrCoMo28	ASTM F1537						

INOX-micro cooled

from Ø 0.2 mm
to Ø 2.0 mm

INOX-micro

from Ø 0.2 mm
to Ø 2.0 mm



Z2 - Sharp

2xD cutting length
5xD neck length

Integrated cooling channels protect the tool from overheating and flush away all chips

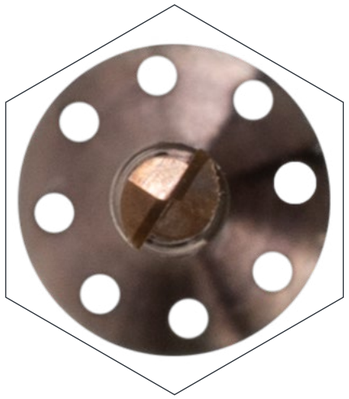
The high-performance α-INOX coating guarantees a long tool life and prevents the cutting edges from sticking

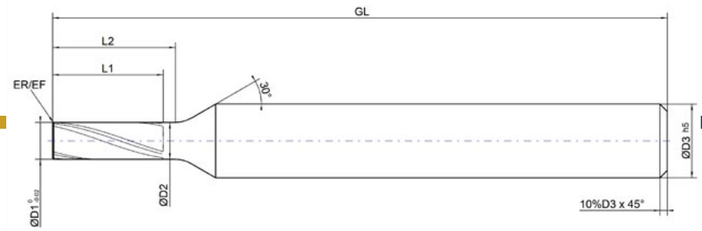
The reinforced shank in h5 quality combined with an optimized working length makes the tool robust and vibration-free.

High feed and cutting speeds are made possible by the use of ultra-fine-grained solid carbide with high fracture toughness.

Z2 - Sharp

2-3xD cutting length



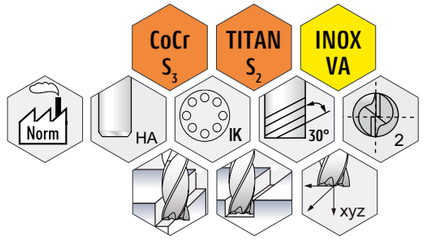


☐ **Order** **Order number:** _____ ☐ **Inquiry**

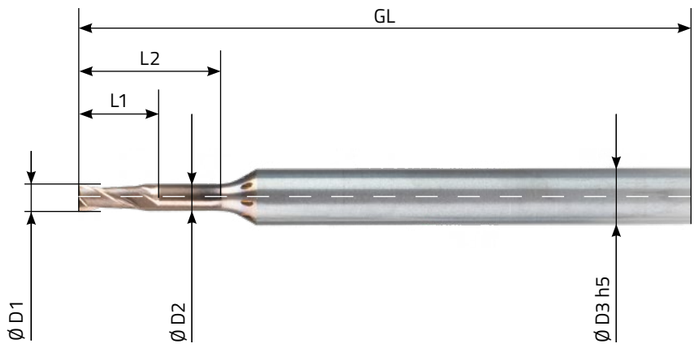
Dimensions: D_1:_____ GL:_____ EF:_____ D_2:_____ L_1:_____ ER:_____ D_3:_____ L_2:_____ Z:_____	**Coating:** ☐ Coated*: _____ ☐ Uncoated	**With cooling channels?** ☐ Yes ☐ No **Cutting direction:** ☐ Left ☐ Right
Material to be machined:	**Shank shape:**	**Quantity:**
Date, signature & company stamp:		**Contact person:**

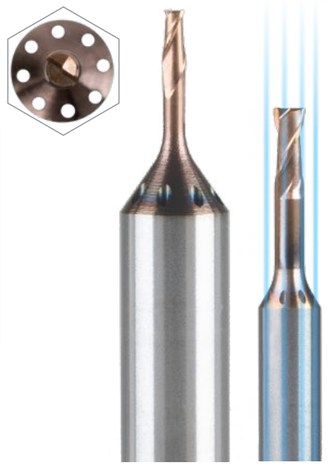
* Without further information, the most suitable coating will be used.

INOX-micro cooled



ACTIONMILL INOX-micro
AM.IM.030.060.IK ← Integrated cooling
D1: Ø 0.30 mm L1: 0.60 mm





5 PRO's of the ACTIONMILL:

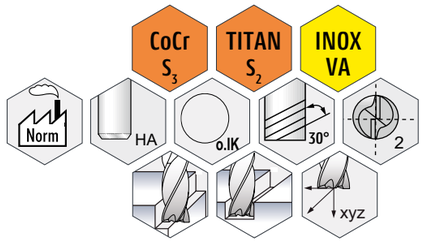
- Protected & sharp mill corner
- Integrated cooling prevents chip accumulation
- Very high feed rates possible
- Short process times and high process reliability
- Very long tool life

Article number	D1 (mm)	D2 (mm)	D3 h5 (mm)	L1 (mm)	L2 (5xD / mm)	GL (mm)
AM.IM.020.040.IK	Ø 0.20	Ø 0.18	Ø 4.00	0.40	1.00	40.00
AM..IM.025.050.IK	Ø 0.25	Ø 0.22	Ø 4.00	0.50	1.25	40.00
AM.IM.030.060.IK	Ø 0.30	Ø 0.25	Ø 4.00	0.60	1.50	40.00
AM.IM.040.080.IK	Ø 0.40	Ø 0.35	Ø 4.00	0.80	2.00	40.00
AM.IM.050.100.IK	Ø 0.50	Ø 0.45	Ø 4.00	1.00	2.50	40.00
AM.IM.060.120.IK	Ø 0.60	Ø 0.55	Ø 4.00	1.20	3.00	40.00
AM.IM.080.160.IK	Ø 0.80	Ø 0.74	Ø 4.00	1.60	4.00	40.00
AM.IM.100.200.IK	Ø 1.00	Ø 0.90	Ø 4.00	2.00	5.00	40.00

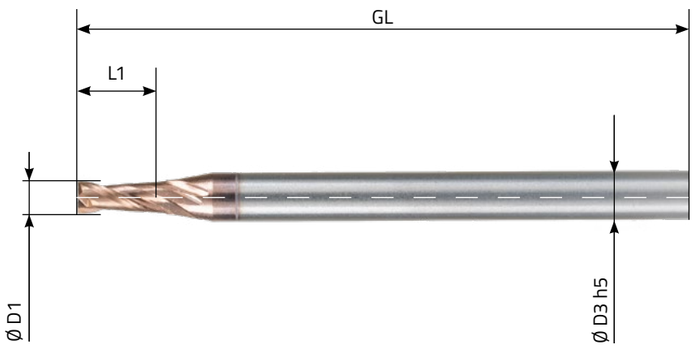
Available from stock

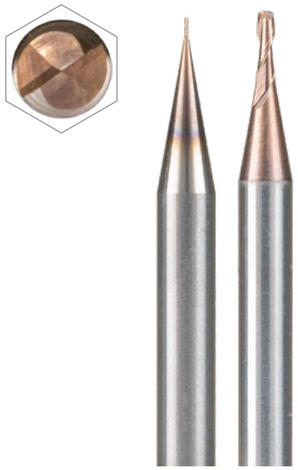
- α-INOX coated

INOX-micro



TARGETMILL INOX-micro
TM.IM.020.050
D1: Ø 0.20 mm L1: 0.50 mm





5 PRO's of the ACTIONMILL:

- Protected & sharp mill corner
- Optimum price/performance ratio
- High feed rates possible
- Short process times and high process reliability
- Long tool life

Article number	D1 (mm)	D3 h6 (mm)	L1 (mm)	Z	GL (mm)
TM.IM.020.050	Ø 0.20	3.00	0.50	2.00	38.00
TM.IM.025.050	Ø 0.25	3.00	0.50	2.00	38.00
TM.IM.030.100	Ø 0.30	3.00	1.00	2.00	38.00
TM.IM.040.100	Ø 0.40	3.00	1.00	2.00	38.00
TM.IM.050.150	Ø 0.50	3.00	1.50	2.00	38.00
TM.IM.060.150	Ø 0.60	3.00	1.50	2.00	38.00
TM.IM.080.200	Ø 0.80	3.00	2.00	2.00	38.00
TM.IM.100.300	Ø 1.00	3.00	3.00	2.00	38.00

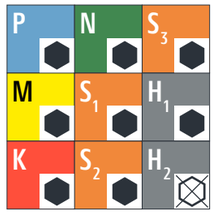
Available from stock

- α-INOX coated

Cutting data - INOX-micro cooled

HBMicrotec® ACTIONTOOLS & ENGINEERING

ACTIONMILL® by HB microtec INOX-micro cooled



Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
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
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

Recommended use ⬢ Highly suitable ⬡ Partially suitable ⊠ Not recommended

Ø 0.3 - Ø 0.8 mm		Ø 0.8 -Ø 1.0 mm	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
20-60	0.003 - 0.01	30-60	0.006 - 0.012
20-60	0.003 - 0.01	30-70	0.006 - 0.012
15-60	0.003 - 0.008	30-60	0.006 - 0.014
15-60	0.003 - 0.008	30-60	0.006 - 0.014
15-60	0.003 - 0.008	30-60	0.006 - 0.014

TARGETMILL® by HB microtec INOX-micro

Material group	Material group	Mat. no.	DIN	AISI/ASTM/UNS
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
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

Ø 0.3 - Ø 0.8 mm		Ø 0.8 -Ø 1.0 mm	
vc [m/min]	fz [mm]	vc [m/min]	fz [mm]
15-50	0.003 - 0.008	30-60	0.004 - 0.01
15-50	0.003 - 0.008	30-70	0.004 - 0.01
15-50	0.003 - 0.008	30-60	0.006 - 0.014
15-50	0.003 - 0.008	30-60	0.006 - 0.014
15-50	0.003 - 0.008	30-60	0.006 - 0.014

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.

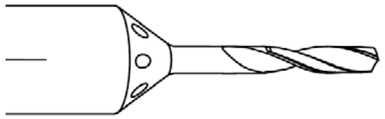
With our process-oriented and holistic solutions and our complete machining service, we are your ideal partner.

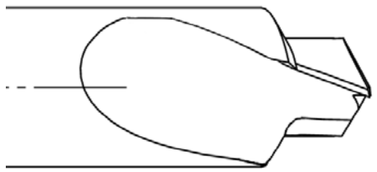
Our comprehensive services also make us a convincing OEM partner for machine tools.

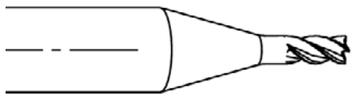
Core competencies

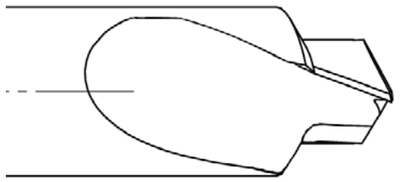
- Comprehensive engineering
- Design of machining processes and cutting tools
- Concepts, project planning, design and manufacture of special tools
- Optimization of processes and machining strategies with the aim of process reliability, shorter run times and accuracy
- CNC and CAM programming (Solid 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

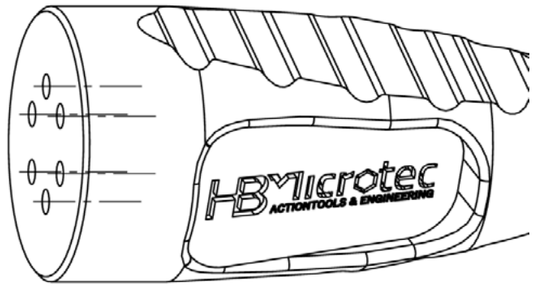
We support you with sound technical advice and assistance. Make use of our extensive know-how. We master every challenge with passion and find the right solution for every machining task!

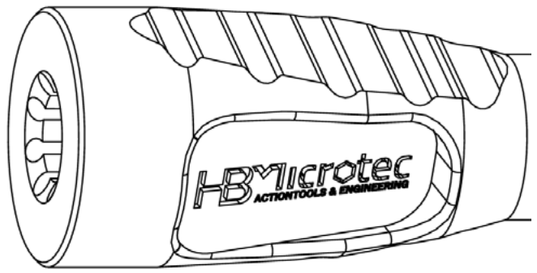


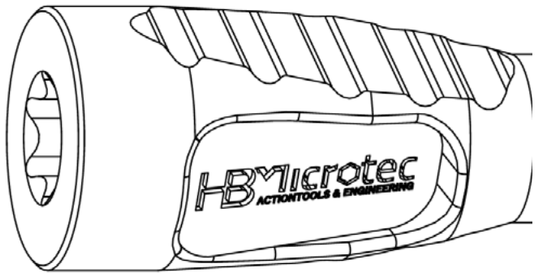


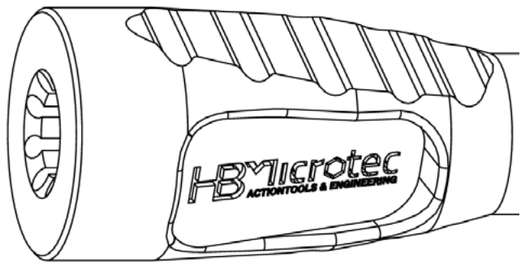












Technical advice included in the price!

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?

Formula index milling

Description	Formula		Legend
Speed	$n=\frac{Vc*1000}{D*\pi}$	[1/min]	D = Mill diameter Dc = Cutting diameter ae = Radial cutting width ap = Axial cutting depth fz = Feed per flute z = Number of flutes n = Revolutions per min. De = Effective cutting diameter Vc = Cutting speed Q = Metal removal rate l = Working length Vf = Feed rate hm = Mean chip thickness kr = Approach angle Pa = Power kc = Specific cutting force ηmt = Efficiency, torque Tc = Machining time
Cutting speed	$Vc=\frac{D*\pi*n}{1000}$	[m/min]	
Feed per flute	$f_z=\frac{f}{z}=\frac{V_f}{z*n}$	[mm/U]	
Feed per revolution	$V_f=f_z*z*n$	[mm/U]	
Feed rate	$f=f_z*n$	[mm/min]	
Chip removal rate	$Q=\frac{a_p*a_e*V_f}{1000}$	$\left[\frac{cm^3}{min}\right]$	
Mean chip thickness (face & shoulder milling) wenn 1)	$h_m=f_z\sqrt{\frac{a_e}{D_c}}$ = mm		
Drive power	$Pa=\frac{a_p*a_e*V_f*k_c}{60*10^6*\eta_{mt}}$ = KW		
Mean chip thickness (wenn .1)	$h_m=\frac{\sin k_r*180*a_e*f_z}{\pi*D_c*\arcsin\left(\frac{a_e}{D_c}\right)}$ = mm		
Machining time	$T_c=\frac{l}{V_f}=min$		
Conversions between systems	1 [mm]= .0394 [inch]	1 [m/min]= 3.28 [SFM]	1 [bar]= 14.5[psi]

Drilling

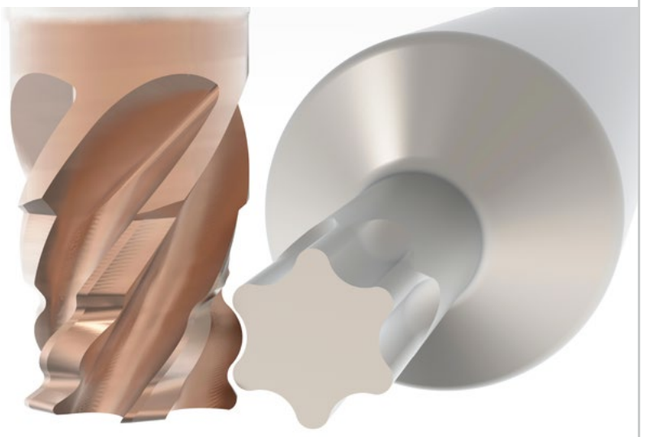
HBMicrotec® ACTIONTOOLS & ENGINEERING

Description	Formula		Legend
Speed	$n=\frac{Vc*1000}{D*\pi}$	[1/min]	D = Cutting diameter f = Feed per revolution fz= Feed per flute n = Speed Vc = Cutting speed vf = Feed rate z = Number of flutes T = Main machining time for maximum drilling depth [sec] L = Effective drilling depth Q = Metal removal rate
Cutting speed	$Vc=\frac{D*\pi*n}{1000}$	[m/min]	
Feed per flute	$f_z=\frac{f}{z}=\frac{V_f}{z*n}$	[mm/U]	
Feed per revolution	$f=f_z*n$	[mm/U]	
Feed rate	$V_f=f_z*z*n$	[mm/min]	
Main machining time	$T=\frac{L}{v_f}*60$	[sec]	
Metal removal rate	$Q=\frac{D^2*\pi*v_f}{4*1000}$	[cm³ / min]	

Description	Formula		Legend
ONLY FOR DRILLING WITHOUT PILOTING			D = Outside diameter Fc = Cutting force Fcz= Cutting force per tooth Md = Torque Pa = Drive power Pc = Cutting power ap = Cutting depth b = Chip width d = Inside diameter D1max = maximum Outer diameter f = Feed rate fz = Feed per flute fB = Drilling process factor [1] fSE = Countersinking process factor [1] h = Chip thickness kc = Specific cutting force [1.2] vc = Cutting speed z = Number of flutes
Cutting force per tooth	$F_{cz}=\frac{D}{2}*f_z*k_c*f_B$	[N]	
Cutting power	$P_c=\frac{F_{cz}*V_c}{60000}$	[kg*m² / s³]	
Torque	$M_d=\frac{F_{cz}*z*\frac{D}{4}}{1000}$	[N*m]	
ONLY FOR DRILLING WITH PILOT HOLE AND COUNTERBORING			
Cutting force per tooth	$F_{cz}=\frac{(D-d)}{2}*f_z*k_c*f_B$	[N]	
Cutting power	$P_c=\frac{F_{cz}*V_c*(1+\frac{d}{D})}{60000}$	[kg*m² / s³]	
Torque	$M_d=\frac{F_{cz}*z*(D+d)}{4000}$	[kg*m² / s²]	

"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!

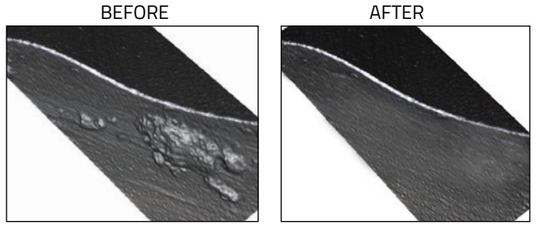
This covers the entire process chain, from geometry development and design to the pre-treatment of the cutting edges, coating and finishing of the surfaces, right through to quality assurance of our ACTIONMILL® and TARGETMILL® tools.

What to expect from the entire HB microtec team:

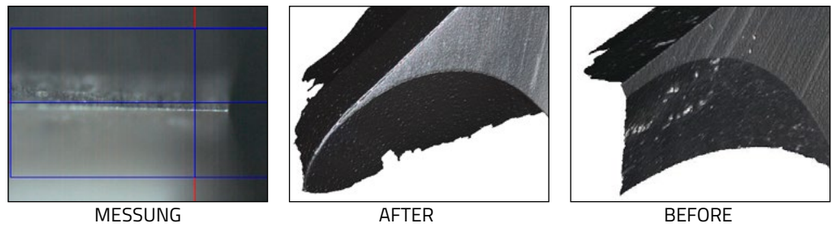
- Innovative specialists in "micro" machining
- State-of-the-art manufacturing equipment and measuring instruments, enabling production in the micron range
- Motivation and passion for challenges
- Repeated precision in the µm range
- Practical service:
  the HB microtec team accompanies and supports 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)

Cutting edge quality

Surface and edge preparation



Cutting edge and surface in detail



Icon legend

Number	Icon	Description
1	CoCr S_3	Material: steel Material: Steel
2	TITAN S_2	Material: titanium Material: Titanium
3	INOX VA	Material: stainless and acid-resistant steels Material: INOX
4	Norm	Design according to HB microtec factory standard Works standard HB microtec
5	HA	Shank form HA Shank design HA
6	o.IK	Drill without internal cooling Drilling without internal cooling
7	o.IK	Without internal cooling Without internal cooling
8	IK	Integrated cooling With integrated cooling
9	2	Flutes 2 (number of cutting edges) Cutting edges 2
10	130°	Point angle 130° Point angle 130°
11	140°	Point angle 140° Point angle 140°
12	30°	Helix angle 30° Helix angle 30°
13	120°	Step angle 120° Step angle 120°
14	xy	Machining direction xy Machining direction xy
15	xyz	Machining direction xyz Machining direction xyz

Number	Icon	Description
16	33°	Spiral angle 33° (helix angle) Helix angle 33°
17	30°	Spiral angle 30° (helix angle) Helix angle 30°
18	2	Number of cutting edges 2 Cutting edges 2
19	3	Number of cutting edges 3 Cutting teeth number 3
20	4	Number of cutting edges 4 Cutting teeth number 4
21		Number of cutting edges Cutting teeth number

Special tool inquiry

We love challenges!

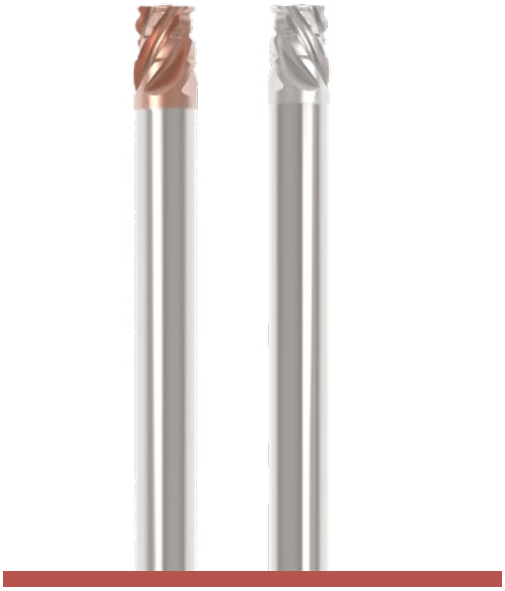
Put us to the test and send us your requirements today! At HB microtec, we love challenges – and the more special they are, the clearer it becomes that we can deliver the unique features you are looking for.

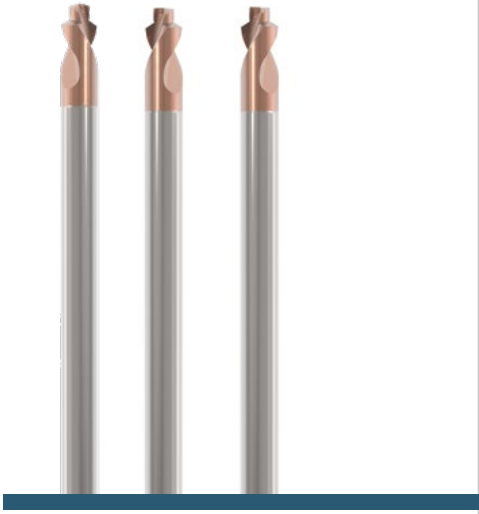
Call +49 7461 1657280 or write to us at kontakt@hb-microtec.de

ACTIONMILL® by HB microtec Intern Starlobe

ACTIONMILL® by HB microtec Extern Starlobe

ACTIONDRILL® by HB microtec Intern Starlobe





HBMicrotec® ACTIONTOOLS & ENGINEERING

HB microtec GmbH & Co. KG
Bischof-Sproll-Straße 6
78532 Tuttlingen
Germany
Tel. +49 7461 1657280
Fax +49 7461 1657281

Email kontakt@hb-microtec.de
Web www.HB-microtec.de