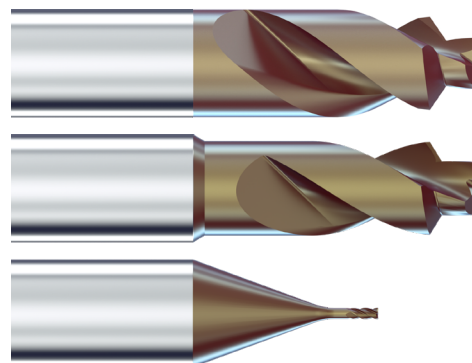




crazy about

hexalobe

THE NEW MACHINING
CONCEPT

NEW

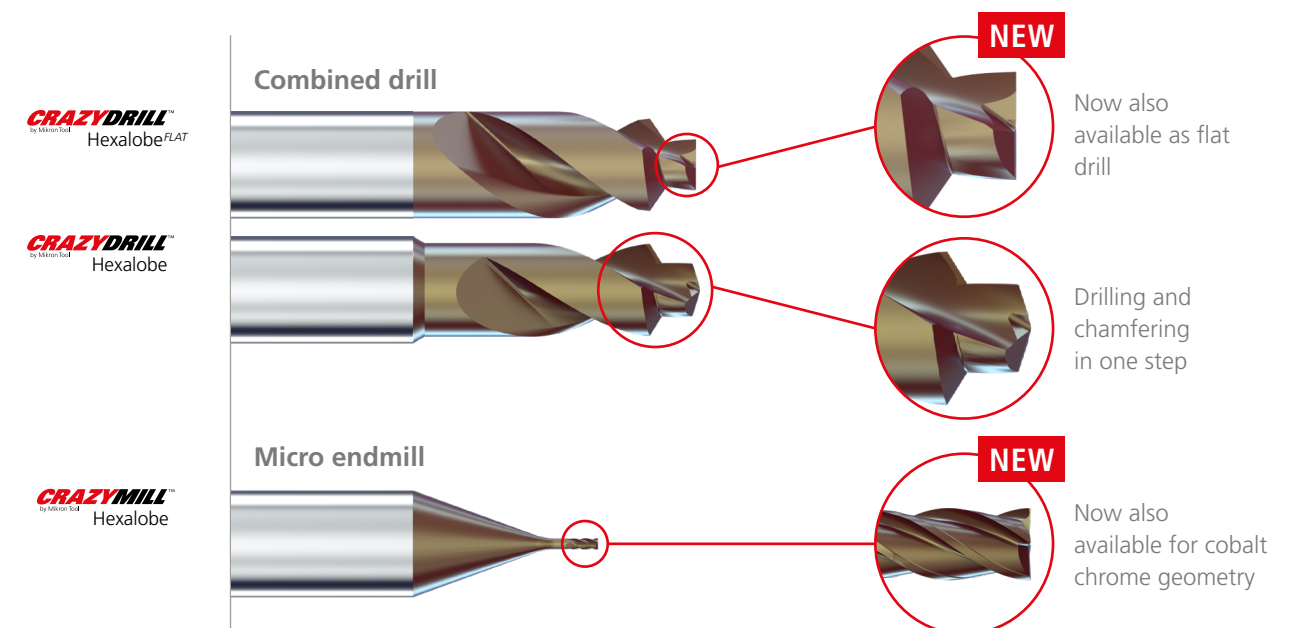
crazy about new concept



THE NEW CONCEPT FOR MACHINING YOUR TORX® SOCKET

New concept

- Drilling - Chamfering - Milling - Deburring: Four operations in three steps with two tools.
- High efficient machining in shorter time for titanium, stainless steel and cobalt chrome.



Performance features

- Highest stiffness
- New cutting geometry



Your advantages

- Shorter milling process
- Highest profile precision
- Excellent surface quality
- Minimal burr

Regrinding: These products are not suitable for regrinding.

Please note: You couldn't find your suitable version of the CrazyDrill Hexalobe / CrazyMill Hexalobe (diameter, length, cutting direction...)? Ask us about our customized versions!

NEW

Best performance on hexalobular sockets

NEW

TURNKEY SOLUTION FOR TITANIUM, STAINLESS STEEL AND COBALT CHROME



Material

■ Titanium

S2

Ti Gr.5 ELI
TiAl6V4 ELI
3.7165

■ Stainless Steel

M

316 LM
X2CrNiMo18-15-3
1.4441

■ Cobalt chrome

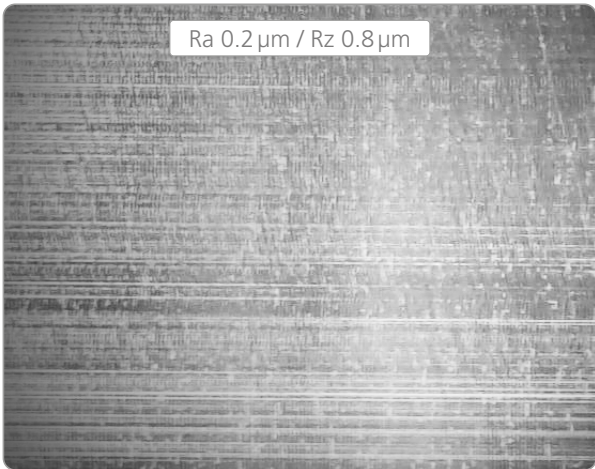
S3

ASTM F1537
CrCoMo28
ISO 5832-12

Shape precision

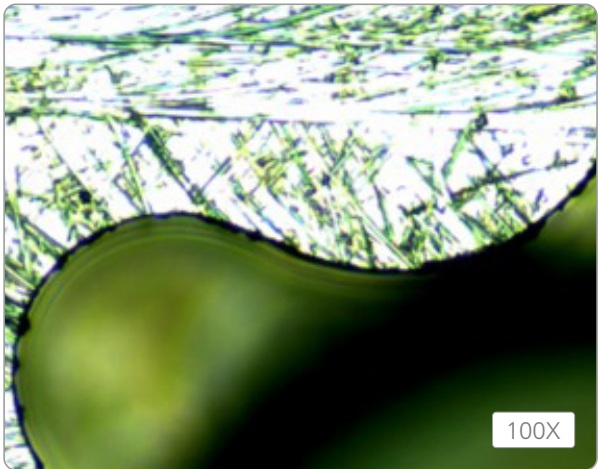
Quality and performance

■ Surface quality



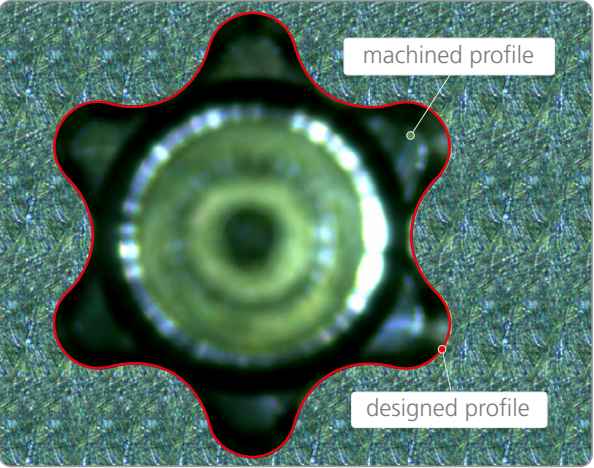
Excellent surface quality.*

■ Nearly burr free



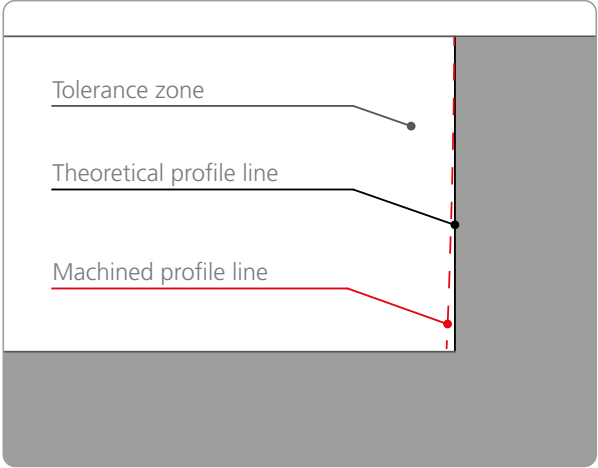
Machining profile with minimal burrs.

■ Nearly perfect profile



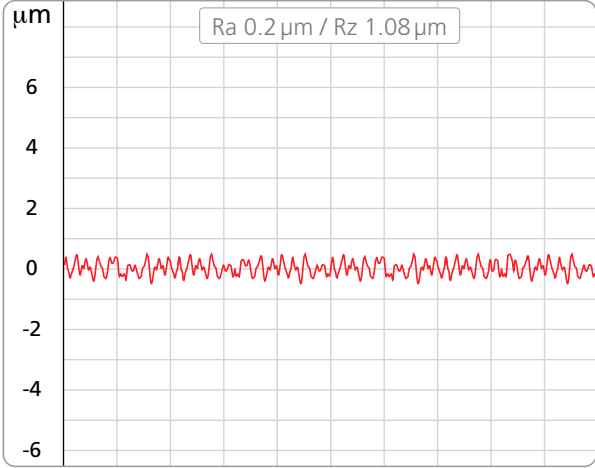
Perfect profile matching.

■ Perpendicularity



Guaranteed profile geometry.

■ Chamfer roughness



Lowest roughness on chamfer surface.*

■ Milling cycle time

TORX® type	Time [s]
T6	27
T8	24
T10	22
T15	22
T20	21
T25	20

Machined on titanium with version 3.5 x d and p = 0.4 x d.*

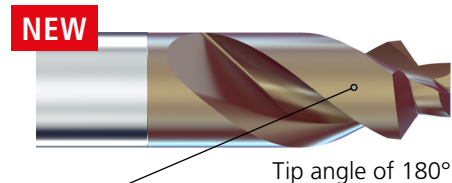
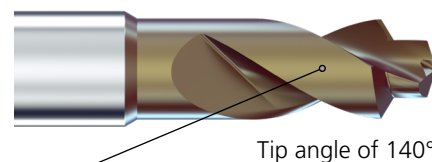
Note *: The quality and cycle time depends on cutting parameters and machine conditions.

NEW

High efficient drilling hexalobular socket

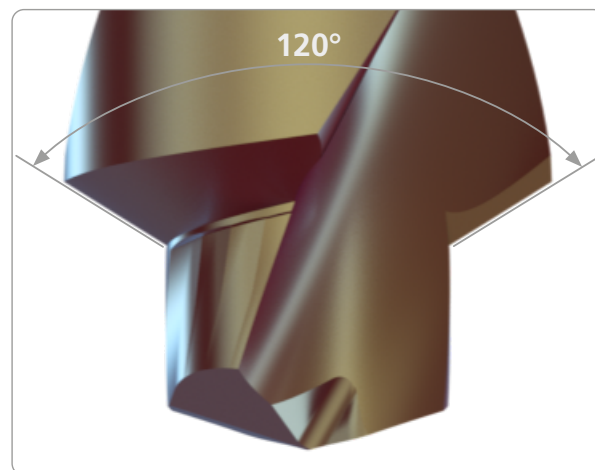
CrazyDrill Hexalobe & CrazyDrill Hexalobe Flat

The new combined drill for TORX® socket machining



Features

■ Two in one



The pre-hole (with tip angle of 140° or 180°) and a 120° chamfer are combined in one single operation.

■ Two cutting geometries

Two types of drills have been developed for best machining titanium, stainless steel and cobalt chrome.

■ Diameter range

Standard diameters for pre-hole drilling "TORX®" socket from T4 to T30.

■ On request

Special sizes available on request.

■ Coating



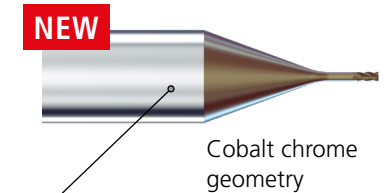
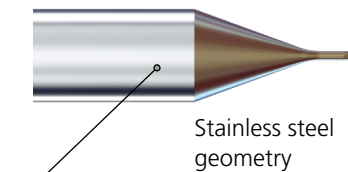
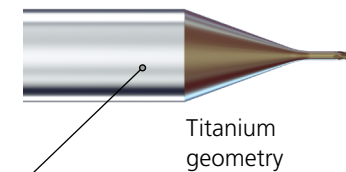
Chrome free coating to avoid cross contamination on medical parts.

High efficient milling hexalobular socket

NEW

CrazyMill Hexalobe

The new endmill for TORX® socket machining

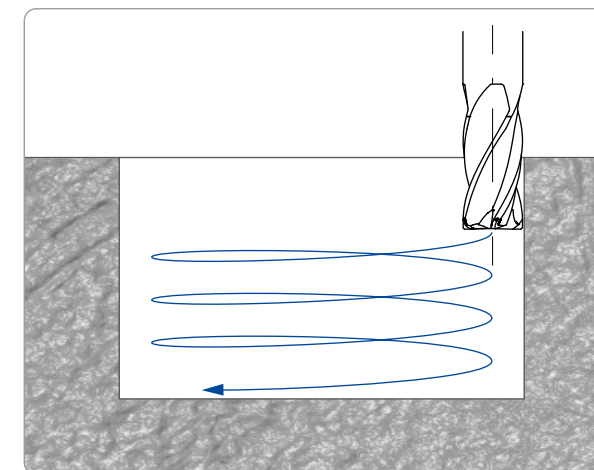


Performance

■ Real cutting conditions

Tested and approved cutting conditions for best process execution and tool life.

■ Helical interpolation



Higher pitch up to 0.8 x d.

■ New carbide

A special micro-grain carbide with high stiffness and edge chipping resistance has been developed to guarantee high profile precision.

■ Three cutting geometries

Three types of endmills have been developed for vibration free machining in titanium, stainless steel and cobalt chrome.

■ Coating



Chrome free coating to avoid cross contamination on medical parts.

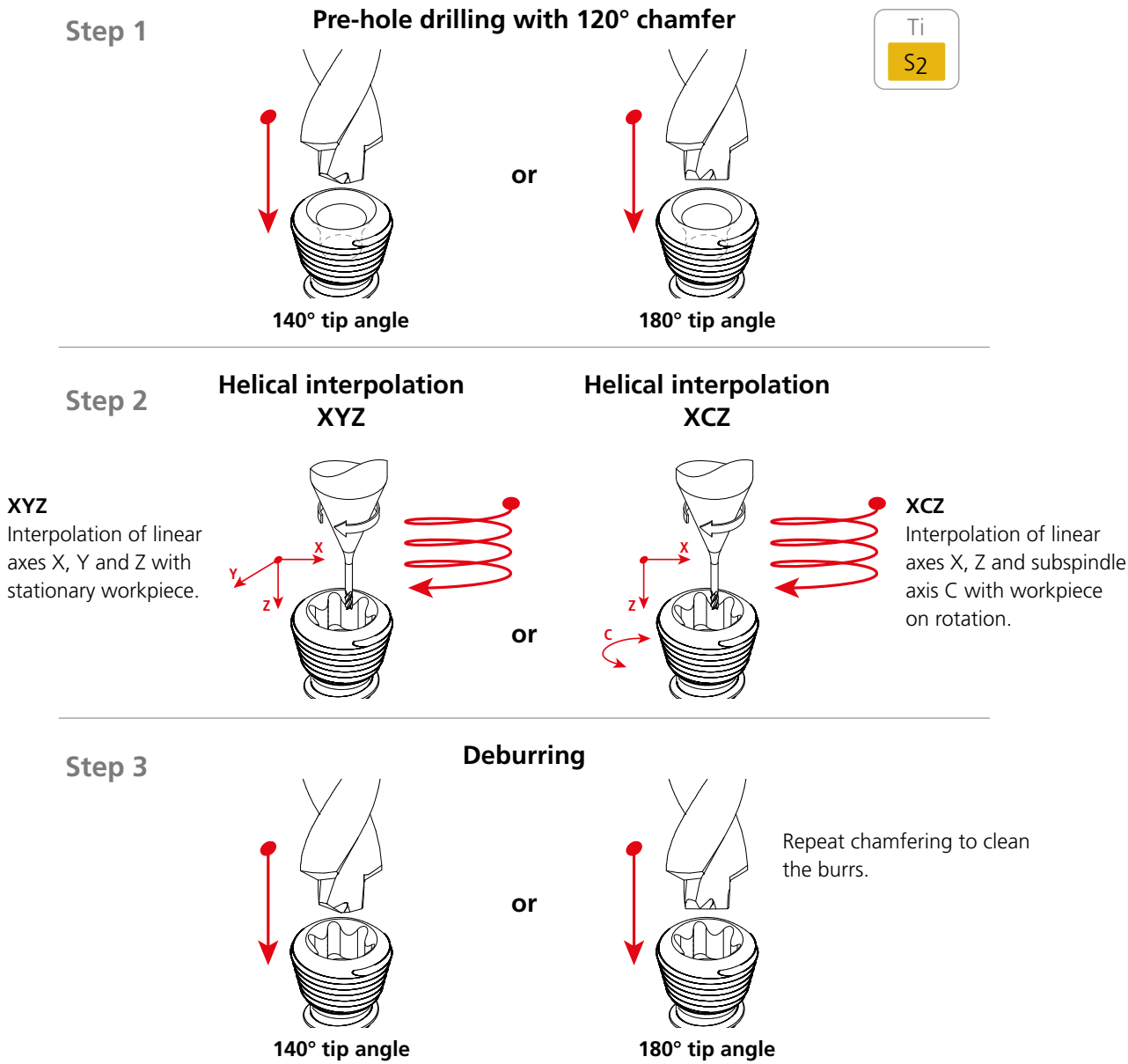
NEW

Machining process

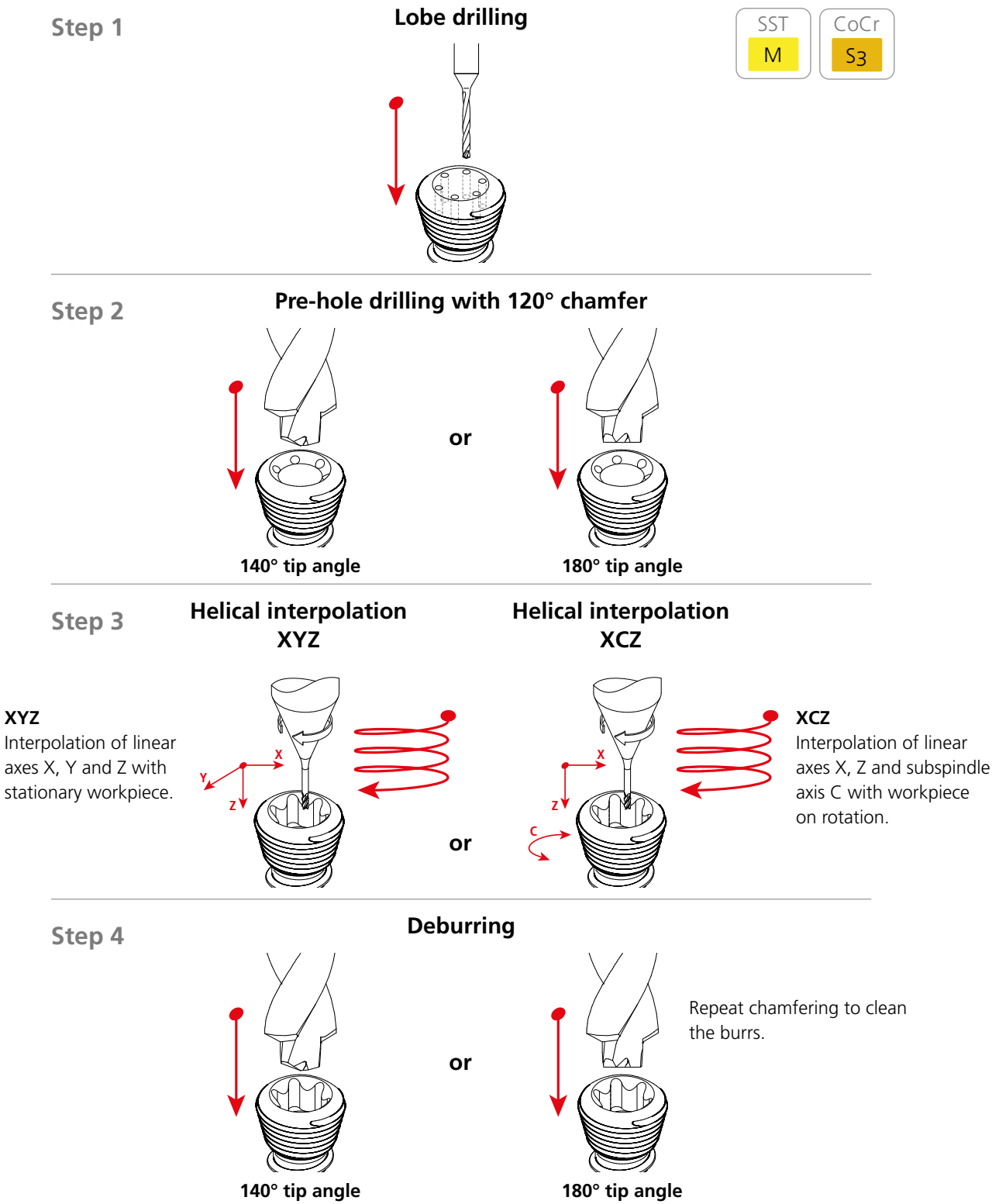
NEW

HELICAL INTERPOLATION FOR TITANIUM

LOBE DRILLING AND HELICAL INTERPOLATION FOR STAINLESS STEEL AND COBALT CHROME



Titanium: Helical interpolation is the optimum process, saving up to 20% of cycle time in comparison to side milling process (see page 10).



Stainless steel: With helical interpolation, drilling of the lobes is required. Result: longer tool life, better dimensional control of the TORX® shape and a more stable process in comparison to side milling process (see page 10).

Cobalt Chrome: Helical interpolation is the optimum process, saving up to 20% of cycle time in comparison to side milling process (see page 11).

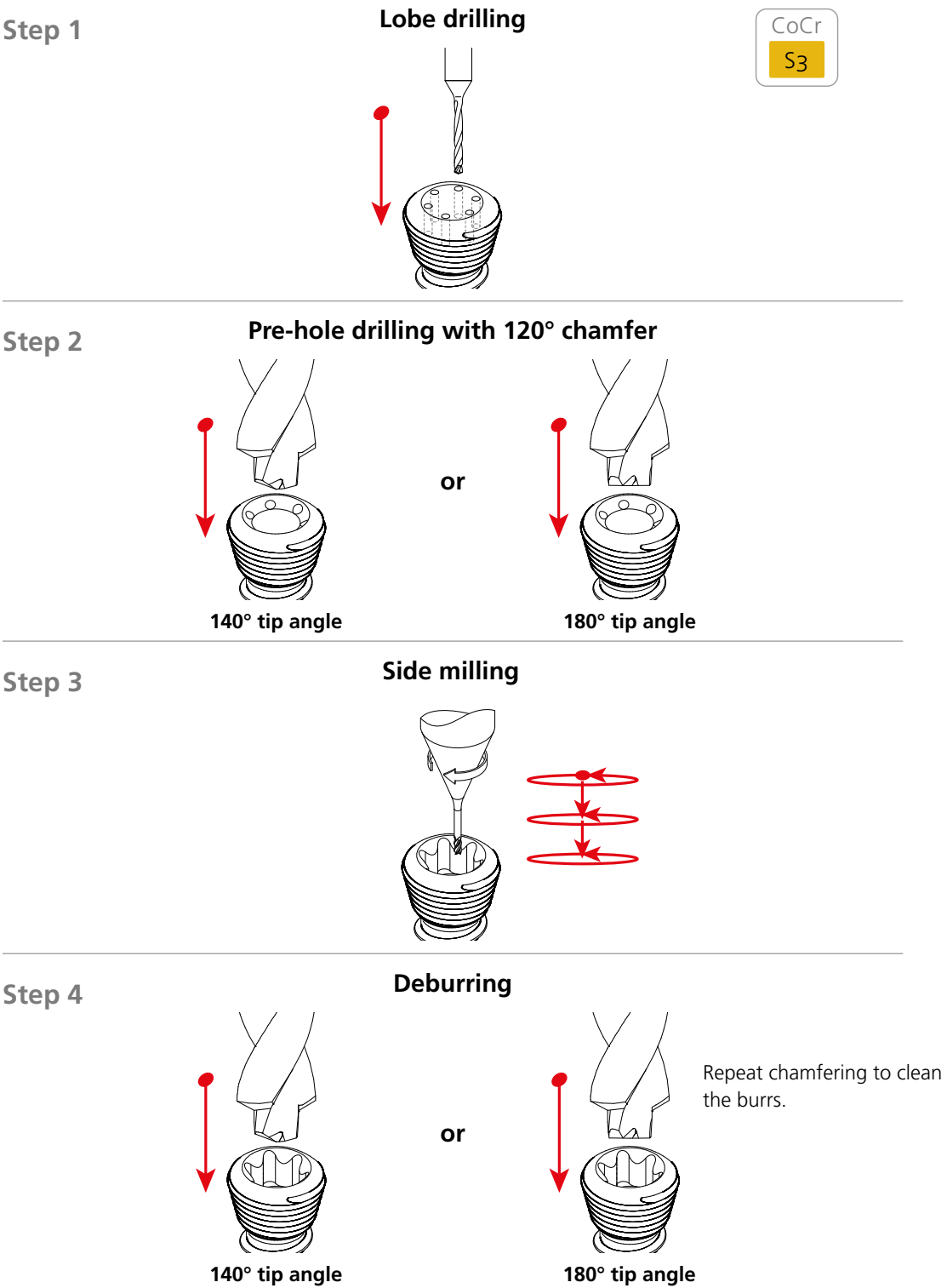
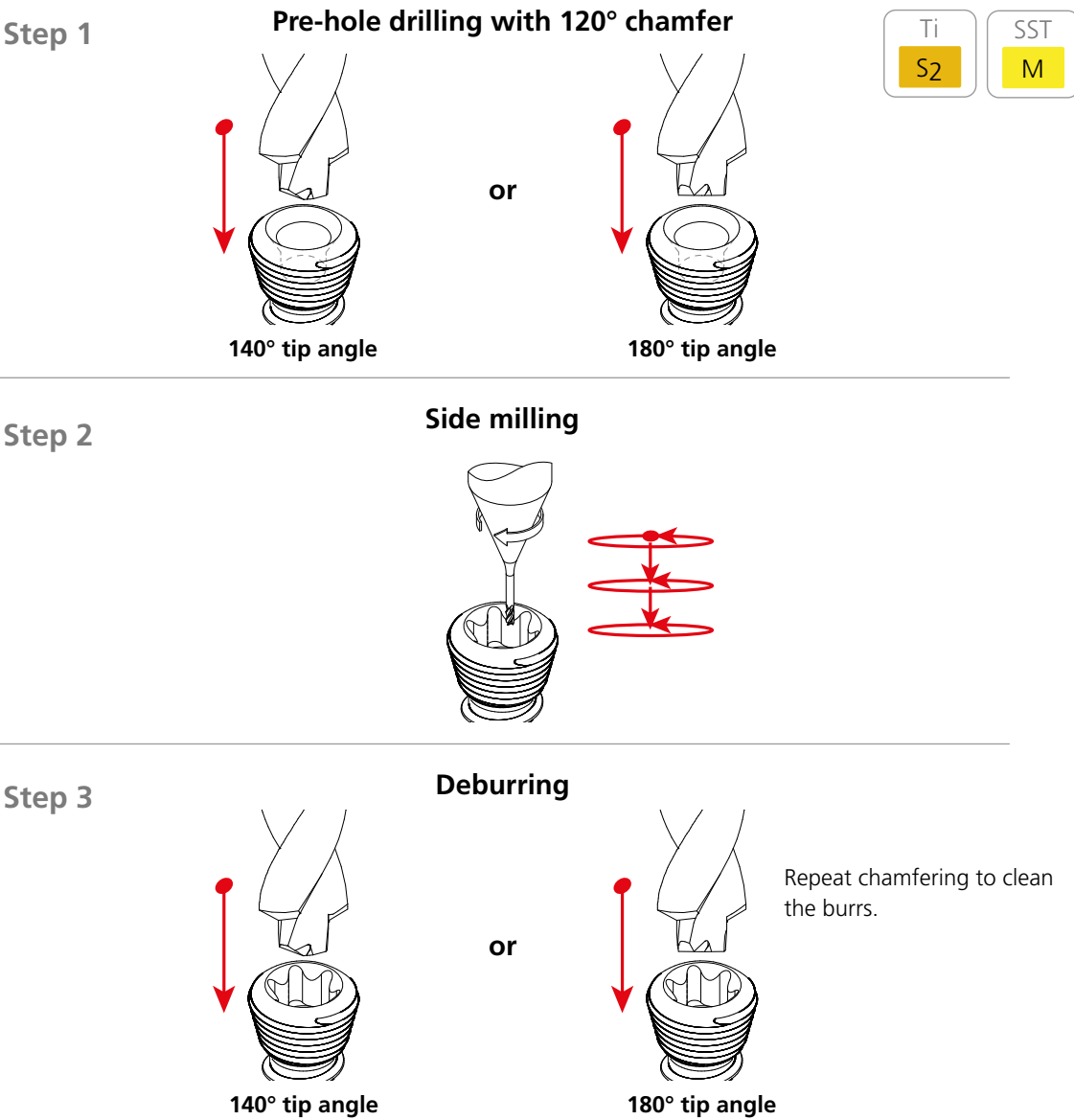
NEW

Machining process

NEW

SIDE MILLING FOR TITANIUM AND STAINLESS STEEL

LOBE DRILLING AND SIDE MILLING FOR COBALT CHROME



Titanium: Helical interpolation is the optimum process (see page 8), saving up to 20% of cycle time in comparison to side milling process.

Stainless steel: With helical interpolation, drilling of the lobes is required (see page 9). Result: longer tool life, better dimensional control of the TORX® shape and a more stable process in comparison to side milling process.

Cobalt chrome: Helical interpolation is the optimum process (see page 9), saving up to 20% of cycle time in comparison to side milling process.

CrazyDrill Hexalobe

CrazyMill Hexalobe

NEW

NEW

- 1 | SHANK
- The reinforced solid carbide shank guarantees stability, high degree of concentricity and hence maximum drilling precision.
- 2 | CARBIDE
- The specially developed micro-grain carbide meets all requirements in terms of mechanical properties.
- 3 | NEW COATING
- The high-performance coating eXedur SNP is heat-resistant and super wear-resistant, prevents buildup edges and promotes uniform chip flushing. The result is long tool life.
- 4 | 120° CHAMFER
- The pre-hole and a 120° chamfer are combined on one single operation.

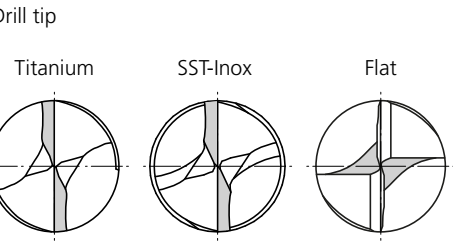
5 | CUTTING GEOMETRY

Two specific geometries have been developed for the machining of:

■ Titanium

■ Stainless steel / Cobalt chrome

Good chip breaking and quick chip removal are guaranteed.



Tip 140°

Flat 180°

3.5xd 5xd 3.5xd 5xd 3.5xd 5xd

Ti

SST / CoCr

Ti / SST / CoCr

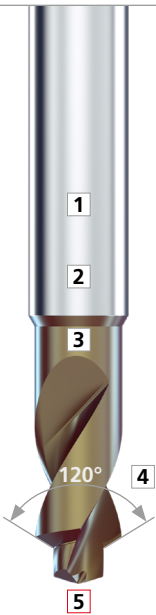
Ti

SST-Inox

CoCr

- Coated
- External cooling

- Coated
- External cooling



- 1 | SHANK
- The robust carbide shank guarantees stable and vibration free milling. A high degree of precision and excellent surface quality are achieved.
- 2 | NEW CARBIDE
- Due to the high degree of toughness and low thermal conductivity of titanium, stainless steel and cobalt chrom, a specially micro-grain carbide with high stiffnessand edge chipping resistance has been developed to perfectly meet all requirements in terms of mechanical properties.
- 3 | NEW COATING
- The high-performance coating eXedur SNP is heat and wear resistant, prevents buildup edges and guarantees optimum chip flushing. The result is a long tool life.

4 | CUTTING GEOMETRY

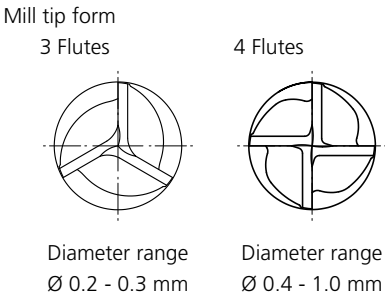
Three specific geometries have been developed for the machining of:

■ Titanium

■ Stainless steel

■ Cobalt chrome

Vibration free cutting for machining with helical interpolation.



CrazyDrill Hexalobe - Tip 140°

CrazyDrill Hexalobe Flat

NEW

Carbide


120°


140°

Z2





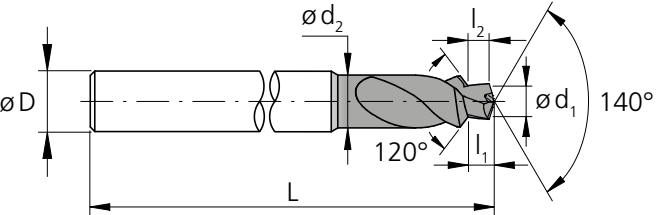
$\varnothing d_1$

0.9 - 3.8 mm

Tolerance

0
- 0.008 mm

Dimensions related to ISO 10664



SST
M

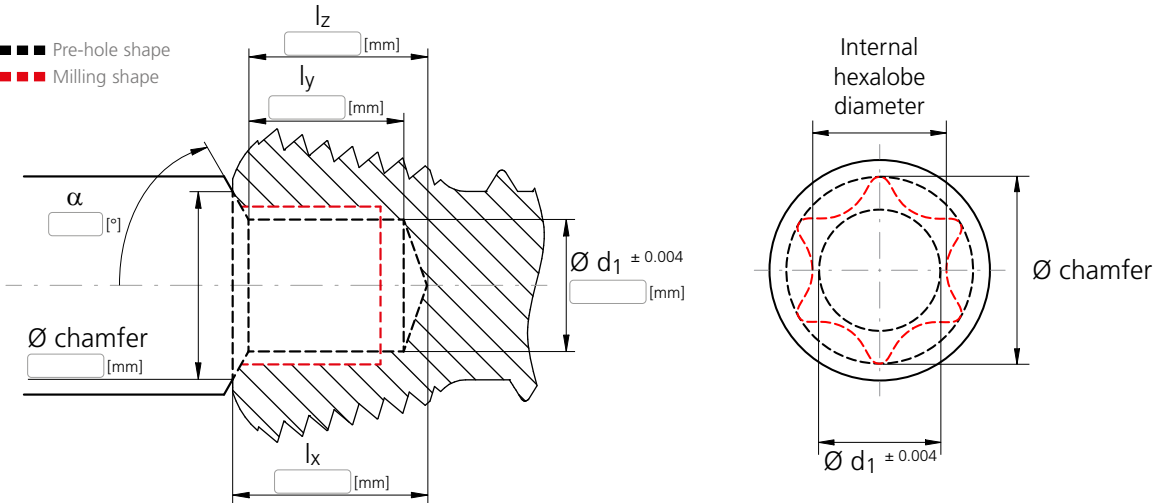
Ti
S2

CoCr
S3

TORX® type	d ₁ 0/-0.008 [mm]	l ₁ [mm]	d ₂ [mm]	l ₂ [mm]	D (h6) [mm]	L [mm]	Item number	Titanium	SST-Inox / CoCr	Availability
T4	0.9	0.70	1.7	0.56	3	40	2.CD.006090.120	.T	.I	■
T5	1.0	0.87	2.0	0.72	3	40	2.CD.007100.120	.T	.I	■
T5	1.0	0.75	2.0	0.59	3	40	2.CD.006100.120	.T	.I	■
T6	1.2	1.06	2.2	0.88	3	40	2.CD.007120.120	.T	.I	■
T6	1.2	0.86	2.2	0.67	3	40	2.CD.006120.120	.T	.I	■
T7	1.4	1.05	3.0	0.83	3	40	2.CD.006140.120	.T	.I	■
T7	1.4	1.01	3.0	0.79	3	40	2.CD.005140.120	.T	.I	■
T8	1.6	1.40	3.0	1.15	3	40	2.CD.007160.120	.T	.I	■
T8	1.6	1.05	3.0	0.81	3	40	2.CD.005160.120	.T	.I	■
T10	1.9	1.42	4.0	1.13	4	40	2.CD.005190.120	.T	.I	■
T15	2.3	1.78	4.0	1.42	4	50	2.CD.006230.120	.T	.I	■
T20	2.7	2.12	5.0	1.70	6	50	2.CD.006270.120	.T	.I	■
T25	3.1	2.84	6.0	2.36	6	50	2.CD.007310.120	.T	.I	■
T30	3.8	3.52	6.0	2.93	6	50	2.CD.008380.120	.T	.I	■
T30	3.8	3.04	6.0	2.45	6	50	2.CD.007380.120	.T	.I	■

■ Stock item

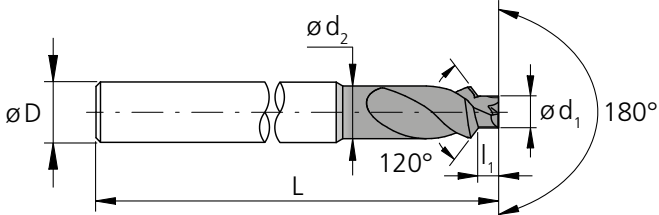
Customized combined drill



Mikron Tool has an international team of cutting technology experts who are pleased to meet your specific needs and requirements.
You can contact us at mto@mikron.com

NEW

Dimensions related to ISO 10664



SST
M

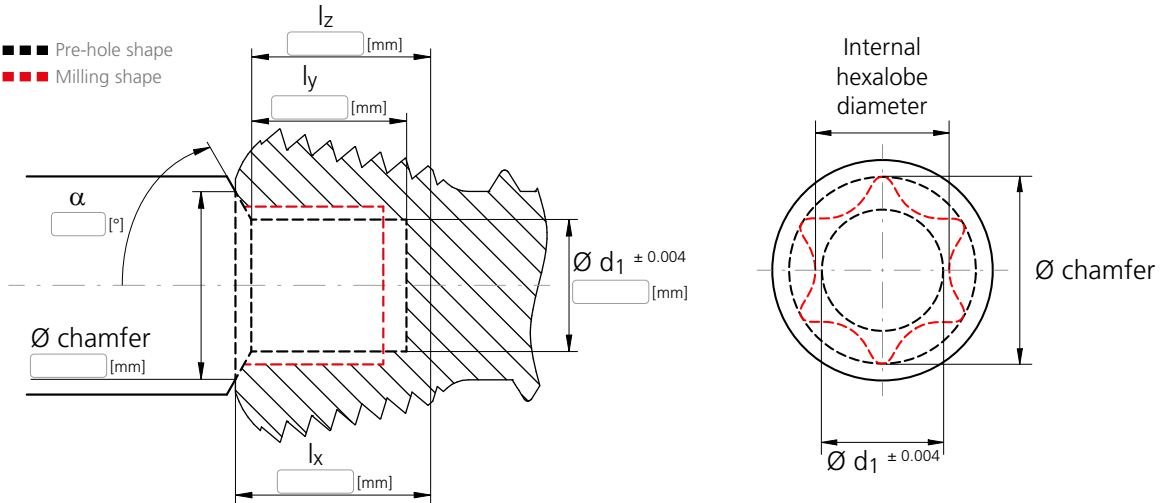
Ti
S2

CoCr
S3

TORX® type	d ₁ 0/-0.008 [mm]	l ₁ [mm]	d ₂ [mm]	D (h6) [mm]	L [mm]	Item number	Availability
T4	0.9	0.56	1.7	3	40	2.CDF.006090.120	■
T5	1.0	0.72	2.0	3	40	2.CDF.007100.120	■
T5	1.0	0.59	2.0	3	40	2.CDF.006100.120	■
T6	1.2	0.88	2.2	3	40	2.CDF.007120.120	■
T6	1.2	0.67	2.2	3	40	2.CDF.006120.120	■
T7	1.4	0.83	3.0	3	40	2.CDF.006140.120	■
T7	1.4	0.79	3.0	3	40	2.CDF.005140.120	■
T8	1.6	1.15	3.0	3	40	2.CDF.007160.120	■
T8	1.6	0.81	3.0	3	40	2.CDF.005160.120	■
T10	1.9	1.13	4.0	4	40	2.CDF.005190.120	■
T15	2.3	1.42	4.0	4	50	2.CDF.006230.120	■
T20	2.7	1.70	5.0	6	50	2.CDF.006270.120	■
T25	3.1	2.36	6.0	6	50	2.CDF.007310.120	■
T30	3.8	2.93	6.0	6	50	2.CDF.008380.120	■
T30	3.8	2.45	6.0	6	50	2.CDF.007380.120	■

■ Stock item

Customized combined drill



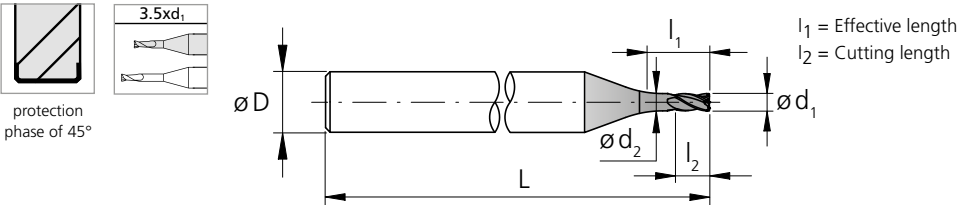
Mikron Tool has an international team of cutting technology experts who are pleased to meet your specific needs and requirements.
You can contact us at mto@mikron.com

NEW CrazyMill Hexalobe

Carbide	Z 3-4					NEW
		Ø d ₁		0.2 - 1.0 mm		
		Tolerance		0 - 0.01 mm		

MILLING WITH EXTERNAL COOLING

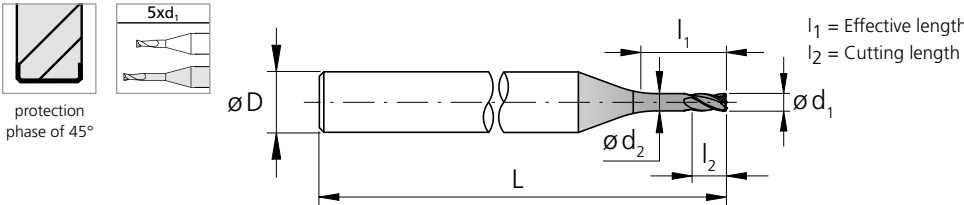
Short version



TORX® type	d ₁ 0/-0.01 [mm]	l ₁ [mm]	l ₂ [mm]	d ₂ [mm]	D (h6) [mm]	L [mm]	Z [Teeth]	Item number Titanium	Item number SST-Inox	Availability
T4	0.20	0.70	0.30	0.19	4	40	3	2.CMT35.B1Z3.020.1	2.CMI35.B1Z3.020.1	■
T5	0.25	0.875	0.40	0.23	4	40	3	2.CMT35.B1Z3.025.1	2.CMI35.B1Z3.025.1	■
T6 / T7	0.30	1.05	0.45	0.28	4	40	3	2.CMT35.B1Z3.030.1	2.CMI35.B1Z3.030.1	■
T8 / T10	0.40	1.40	0.60	0.38	4	40	4	2.CMT35.B1Z4.040.1	2.CMI35.B1Z4.040.1	■
T10 / T15	0.50	1.75	0.75	0.47	4	40	4	2.CMT35.B1Z4.050.1	2.CMI35.B1Z4.050.1	■
T20	0.60	2.10	0.90	0.56	4	40	4	2.CMT35.B1Z4.060.1	2.CMI35.B1Z4.060.1	■
T25	0.80	2.80	1.20	0.75	4	40	4	2.CMT35.B1Z4.080.1	2.CMI35.B1Z4.080.1	■
T30	1.00	3.50	1.50	0.94	4	40	4	2.CMT35.B1Z4.100.1	2.CMI35.B1Z4.100.1	■

■ Stock item

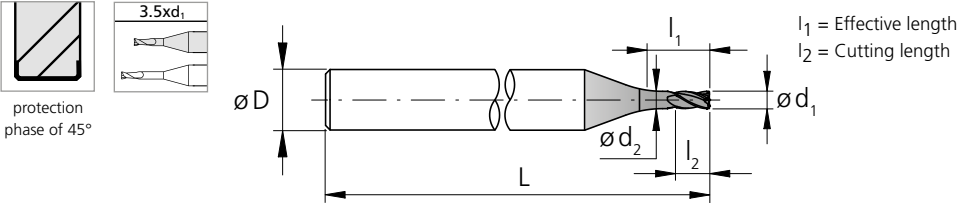
Long version



TORX® type	d ₁ 0/-0.01 [mm]	l ₁ [mm]	l ₂ [mm]	d ₂ [mm]	D (h6) [mm]	L [mm]	Z [Teeth]	Item number Titanium	Item number SST-Inox	Availability
T4	0.20	1.00	0.30	0.19	4	40	3	2.CMT35.C1Z3.020.1	2.CMI35.C1Z3.020.1	■
T5	0.25	1.25	0.40	0.23	4	40	3	2.CMT35.C1Z3.025.1	2.CMI35.C1Z3.025.1	■
T6 / T7	0.30	1.50	0.45	0.28	4	40	3	2.CMT35.C1Z3.030.1	2.CMI35.C1Z3.030.1	■
T8 / T10	0.40	2.00	0.60	0.38	4	40	4	2.CMT35.C1Z4.040.1	2.CMI35.C1Z4.040.1	■
T10 / T15	0.50	2.50	0.75	0.47	4	40	4	2.CMT35.C1Z4.050.1	2.CMI35.C1Z4.050.1	■
T20	0.60	3.00	0.90	0.56	4	40	4	2.CMT35.C1Z4.060.1	2.CMI35.C1Z4.060.1	■
T25	0.80	4.00	1.20	0.75	4	40	4	2.CMT35.C1Z4.080.1	2.CMI35.C1Z4.080.1	■
T30	1.00	5.00	1.50	0.94	4	40	4	2.CMT35.C1Z4.100.1	2.CMI35.C1Z4.100.1	■

■ Stock item

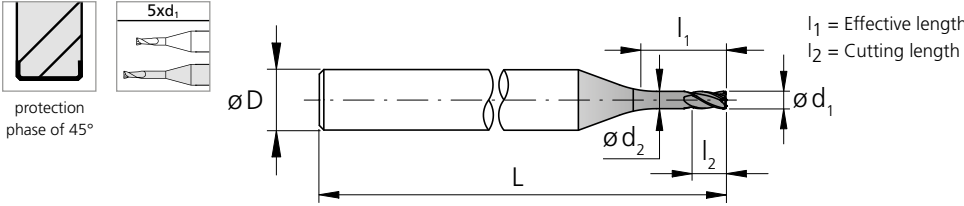
NEW Short version



TORX® type	d ₁ 0/-0.01 [mm]	l ₁ [mm]	l ₂ [mm]	d ₂ [mm]	D (h6) [mm]	L [mm]	Z [Teeth]	Item number Cobalt - Chrome	Availability
T4	0.20	0.70	0.30	0.19	4	40	3	2.CMR35.B1Z3.020.1	■
T5	0.25	0.875	0.40	0.23	4	40	3	2.CMR35.B1Z3.025.1	■
T6 / T7	0.30	1.05	0.45	0.28	4	40	3	2.CMR35.B1Z3.030.1	■
T8 / T10	0.40	1.40	0.60	0.38	4	40	4	2.CMR35.B1Z4.040.1	■
T10 / T15	0.50	1.75	0.75	0.47	4	40	4	2.CMR35.B1Z4.050.1	■
T20	0.60	2.10	0.90	0.56	4	40	4	2.CMR35.B1Z4.060.1	■
T25	0.80	2.80	1.20	0.75	4	40	4	2.CMR35.B1Z4.080.1	■
T30	1.00	3.50	1.50	0.94	4	40	4	2.CMR35.B1Z4.100.1	■

■ Stock item

NEW Long version



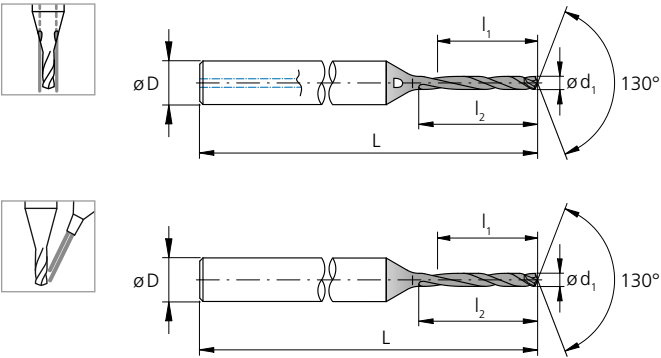
TORX® type	d ₁ 0/-0.01 [mm]	l ₁ [mm]	l ₂ [mm]	d ₂ [mm]	D (h6) [mm]	L [mm]	Z [Teeth]	Item number Cobalt - Chrome	Availability
T4	0.20	1.00	0.30	0.19	4	40	3	2.CMR35.C1Z3.020.1	■
T5	0.25	1.25	0.40	0.23	4	40	3	2.CMR35.C1Z3.025.1	■
T6 / T7	0.30	1.50	0.45	0.28	4	40	3	2.CMR35.C1Z3.030.1	■
T8 / T10	0.40	2.00	0.60	0.38	4	40	4	2.CMR35.C1Z4.040.1	■
T10 / T15	0.50	2.50	0.75	0.47	4	40	4	2.CMR35.C1Z4.050.1	■
T20	0.60	3.00	0.90	0.56	4	40	4	2.CMR35.C1Z4.060.1	■
T25	0.80	4.00	1.20	0.75	4	40	4	2.CMR35.C1Z4.080.1	■
T30	1.00	5.00	1.50	0.94	4	40	4	2.CMR35.C1Z4.100.1	■

■ Stock item

CrazyDrill SST-Inox - Type IK / IN

Cutting tool recommendation

Carbide			Z2	
	$\varnothing d_1$		0.1 - 3.0 mm	
	Tolerance		+ 0.004 mm 0	

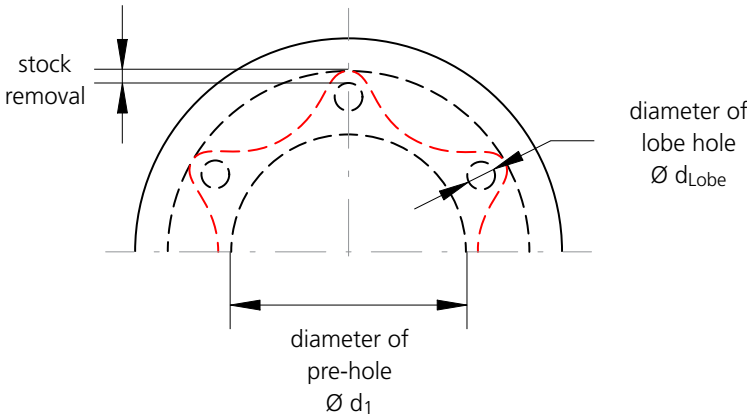


TORX® type	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	D (h6) [mm]	L [mm]	Item number Integrated cooling	Item number External cooling	Availability
T4 - T5	0.25	2.0	2.5	3	38	2.CD.080025.IK	2.CD.080025.IN	■
T6	0.30	2.4	2.9	3	38	2.CD.080030.IK	2.CD.080030.IN	■
T7	0.35	2.8	3.4	3	38	2.CD.080035.IK	2.CD.080035.IN	■
T8	0.40	3.2	3.9	3	38	2.CD.080040.IK	2.CD.080040.IN	■
T10	0.50	4.0	4.9	3	42	2.CD.080050.IK	2.CD.080050.IN	■
T15	0.60	4.8	5.9	3	42	2.CD.080060.IK	2.CD.080060.IN	■
T20	0.70	5.6	6.9	3	45	2.CD.080070.IK	2.CD.080070.IN	■
T25	0.80	6.4	7.8	3	45	2.CD.080080.IK	2.CD.080080.IN	■
T30	1.00	8.0	9.8	3	48	2.CD.080100.IK	2.CD.080100.IN	■

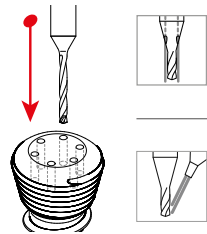
■ Stock item

Only for process with lobe drilling in stainless steel or chrome cobalt

TORX® type	d _{Lobe} [mm]	Stock removal [mm]	Lobe drilling		Pre-hole drilling	Socket milling	
			Integrated cooling	External cooling		Stainless steel	Chrome cobalt
T4	0.25	0.02	2.CD.080025.IK	2.CD.080025.IN	2.CD.006090.120.I	2.CMI35.B1Z3.020.1 2.CMI35.C1Z3.020.1	2.CMR35.B1Z3.020.1 2.CMR35.C1Z3.020.1
T5	0.25	0.05	2.CD.080025.IK	2.CD.080025.IN	2.CD.007100.120.I	2.CMI35.B1Z3.020.1 2.CMI35.C1Z3.020.1	2.CMR35.B1Z3.020.1 2.CMR35.C1Z3.020.1
T5	0.25	0.05	2.CD.080025.IK	2.CD.080025.IN	2.CD.006100.120.I	2.CMI35.B1Z3.020.1 2.CMI35.C1Z3.020.1	2.CMR35.B1Z3.020.1 2.CMR35.C1Z3.020.1
T6	0.30	0.05	2.CD.080030.IK	2.CD.080030.IN	2.CD.007120.120.I	2.CMI35.B1Z3.030.1 2.CMI35.C1Z3.030.1	2.CMR35.B1Z3.030.1 2.CMR35.C1Z3.030.1
T6	0.30	0.05	2.CD.080030.IK	2.CD.080030.IN	2.CD.006120.120.I	2.CMI35.B1Z3.030.1 2.CMI35.C1Z3.030.1	2.CMR35.B1Z3.030.1 2.CMR35.C1Z3.030.1
T7	0.35	0.07	2.CD.080035.IK	2.CD.080035.IN	2.CD.006140.120.I	2.CMI35.B1Z3.030.1 2.CMI35.C1Z3.030.1	2.CMR35.B1Z3.030.1 2.CMR35.C1Z3.030.1
T7	0.35	0.07	2.CD.080035.IK	2.CD.080035.IN	2.CD.005140.120.I	2.CMI35.B1Z3.030.1 2.CMI35.C1Z3.030.1	2.CMR35.B1Z3.030.1 2.CMR35.C1Z3.030.1
T8	0.40	0.08	2.CD.080040.IK	2.CD.080040.IN	2.CD.007160.120.I	2.CMI35.B1Z4.040.1 2.CMI35.C1Z4.040.1	2.CMR35.B1Z4.040.1 2.CMR35.C1Z4.040.1
T8	0.40	0.08	2.CD.080040.IK	2.CD.080040.IN	2.CD.005160.120.I	2.CMI35.B1Z4.040.1 2.CMI35.C1Z4.040.1	2.CMR35.B1Z4.040.1 2.CMR35.C1Z4.040.1
T10	0.50	0.06	2.CD.080050.IK	2.CD.080050.IN	2.CD.005190.120.I	2.CMI35.B1Z4.040.1 2.CMI35.C1Z4.040.1 2.CMI35.B1Z4.050.1 2.CMI35.C1Z4.050.1	2.CMR35.B1Z4.040.1 2.CMR35.C1Z4.040.1 2.CMR35.B1Z4.050.1 2.CMR35.C1Z4.050.1
T15	0.60	0.07	2.CD.080060.IK	2.CD.080060.IN	2.CD.006230.120.I	2.CMI35.B1Z4.050.1 2.CMI35.C1Z4.050.1	2.CMR35.B1Z4.050.1 2.CMR35.C1Z4.050.1
T20	0.70	0.09	2.CD.080070.IK	2.CD.080070.IN	2.CD.006270.120.I	2.CMI35.B1Z4.060.1 2.CMI35.C1Z4.060.1	2.CMR35.B1Z4.060.1 2.CMR35.C1Z4.060.1
T25	0.80	0.10	2.CD.080080.IK	2.CD.080080.IN	2.CD.007310.120.I	2.CMI35.B1Z4.080.1 2.CMI35.C1Z4.080.1	2.CMR35.B1Z4.080.1 2.CMR35.C1Z4.080.1
T30	1.00	0.12	2.CD.080100.IK	2.CD.080100.IN	2.CD.008380.120.I	2.CMI35.B1Z4.100.1 2.CMI35.C1Z4.100.1	2.CMR35.B1Z4.100.1 2.CMR35.C1Z4.100.1
T30	1.00	0.12	2.CD.080100.IK	2.CD.080100.IN	2.CD.007380.120.I	2.CMI35.B1Z4.100.1 2.CMI35.C1Z4.100.1	2.CMR35.B1Z4.100.1 2.CMR35.C1Z4.100.1

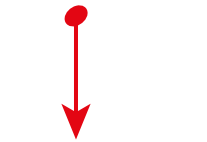


Lobe drilling



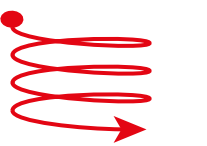
Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	v _c [m/min]	Q _i	Q _s				T4 Ød1 0.25 mm	T5 Ød1 0.30 mm	T6 Ød1 0.30 mm	T7 Ød1 0.30 mm	T8 Ød1 0.40 mm	T10 Ød1 0.50 mm	T15 Ød1 0.60 mm	T20 Ød1 0.70 mm	T25 Ød1 0.80 mm	T30 Ød1 1.00 mm
											f	f	f	f	f	f	f	f	f	f
M	Stainless steel austenitic	1.4435	X2CrNiMo 18-14-3	AISI 316L	30 – 45	1-4xd1	1-2xd1				0.01 - 0.02	0.01 - 0.02	0.01 - 0.02	0.01 - 0.02	0.01 - 0.02	0.01 - 0.02	0.015 - 0.025	0.015 - 0.025	0.015 - 0.025	0.025 - 0.035
		1.4441	X2CrNiMo 18-15-3	AISI 316LM																
S ₃	CrCo alloys	2.4964	CoCr20W15Ni	Haynes 25	40 – 50	1-3xd1	1-2xd1				0.02 - 0.03	0.02 - 0.03	0.02 - 0.03	0.02 - 0.03	0.02 - 0.03	0.02 - 0.03	0.015 - 0.020	0.015 - 0.020	0.015 - 0.020	0.05 - 0.06
			CrCoMo28	ASTM F1537																
M	Stainless steel austenitic	1.4435	X2CrNiMo 18-14-3	AISI 316L	25 – 30	0.5-1xd1	0.5xd1				0.010 - 0.015	0.010 - 0.015	0.010 - 0.015	0.010 - 0.015	0.010 - 0.015	0.010 - 0.015	0.015 - 0.020	0.015 - 0.020	0.015 - 0.020	0.02 - 0.03
		1.4441	X2CrNiMo 18-15-3	AISI 316LM																
S ₃	CrCo alloys	2.4964	CoCr20W15Ni	Haynes 25	25 – 35	0.5-1xd1	0.5xd1				0.015 - 0.025	0.015 - 0.025	0.015 - 0.025	0.015 - 0.025	0.015 - 0.025	0.015 - 0.025	0.025 - 0.035	0.025 - 0.035	0.025 - 0.035	0.04 - 0.05
			CrCoMo28	ASTM F1537																

Pre-hole drilling



drilling

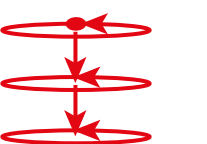
Helical interpolation (XYZ / XCZ) - 3.5 x d / 5 x d



Interpolation (XYZ / X CZ) - 3.5 x d / 5 x d																						v_c [m/min]		f_z [mm]		p [mm]			
Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	p (pitch)		T4 $\varnothing d_1$ 0.20 mm		T5 $\varnothing d_1$ 0.25 mm		T6 - T7 $\varnothing d_1$ 0.30 mm		T8 - T10 $\varnothing d_1$ 0.40 mm		T10 - T15 $\varnothing d_1$ 0.50 mm		T20 $\varnothing d_1$ 0.60 mm		T25 $\varnothing d_1$ 0.80 mm		T30 $\varnothing d_1$ 1.00 mm								
					3.5 x d1	5 x d1	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z							
M	Stainless steel austenitic	1.4435	X2CrNiMo 18-14-3	AISI 316L	0.2 - 0.8 x d1	0.1 - 0.4 x d1	20 - 40	0.0010	25 - 50	0.0010	30 - 60	0.0010	40 - 75	0.0015	50 - 90	0.0020	60 - 100	0.0025	70 - 130	0.0030	80 - 140	0.0040							
		1.4441	X2CrNiMo 18-15-3	AISI 316LM																									
S ₂	Titanium alloys	3.7165	TiAl6V4	ASTM B348 / F136	0.2 - 0.8 x d1	0.1 - 0.4 x d1	20 - 40	0.0010	25 - 50	0.0010	30 - 60	0.0010	40 - 75	0.0015	50 - 90	0.0020	60 - 100	0.0025	70 - 130	0.0030	80 - 140	0.0040							
		9.9367	TiAl6Nb7	ASTM F1295																									
S ₃	CrCo alloys	2.4964	CoCr20W15Ni	Haynes 25	0.2 - 0.8 x d1	0.1 - 0.4 x d1	20 - 40	0.0008	25 - 50	0.0008	30 - 60	0.0008	40 - 75	0.0012	50 - 90	0.0015	60 - 100	0.0020	70 - 130	0.0025	80 - 140	0.0030							
			CrCoMo28	ASTM F1537																									

Note: In case of p = 0.8 x d1 decrease the feed fz by 30% to increase tool life and profile precision.

Side milling - 3.5 x d / 5 x d



ng - 3.5 x d / 5 x d																									
																						v_c [m/min]		a_p [mm]	
																						f_z [mm]		a_e [mm]	
Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	$a_{p, max}$	a_e	T4 $\varnothing d1$ 0.20 mm		T5 $\varnothing d1$ 0.25 mm		T6 - T7 $\varnothing d1$ 0.30 mm		T8 - T10 $\varnothing d1$ 0.40 mm		T10 - T15 $\varnothing d1$ 0.50 mm		T20 $\varnothing d1$ 0.60 mm		T25 $\varnothing d1$ 0.80 mm		T30 $\varnothing d1$ 1.00 mm				
							v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z	v_c	f_z			
M	Stainless steel austenitic	1.4435	X2CrNiMo 18-14-3	AISI 316L	0.5 x d1	0.1 x d1	20 - 40	0.0015	25 - 50	0.0025	30 - 60	0.0030	40 - 75	0.0045	50 - 90	0.0060	60 - 100	0.0065	70 - 130	0.0080	80 - 140	0.0100			
		1.4441	X2CrNiMo 18-15-3	AISI 316LM																					
S ₂	Titanium alloys	3.7165	TiAl6V4	ASTM B348 / F136	0.5 x d1	variable	20 - 40	0.0015	25 - 50	0.0025	30 - 60	0.0030	40 - 75	0.0045	50 - 90	0.0060	60 - 100	0.0065	70 - 130	0.0080	80 - 140	0.0100			
		9.9367	TiAl6Nb7	ASTM F1295																					
S ₃	CrCo alloys	2.4964	CoCr20W15Ni	Haynes 25	0.5 x d1	0.1 x d1	20 - 40	0.0012	25 - 50	0.0020	30 - 60	0.0025	40 - 75	0.0035	50 - 90	0.0045	60 - 100	0.0050	70 - 130	0.0060	80 - 140	0.0075			
			CrCoMo28	ASTM F1537																					

General advise: Cutting conditions have been tested and approved with n = 30'000 - 40'000 rpm, different cutting speeds may affect tool life.



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