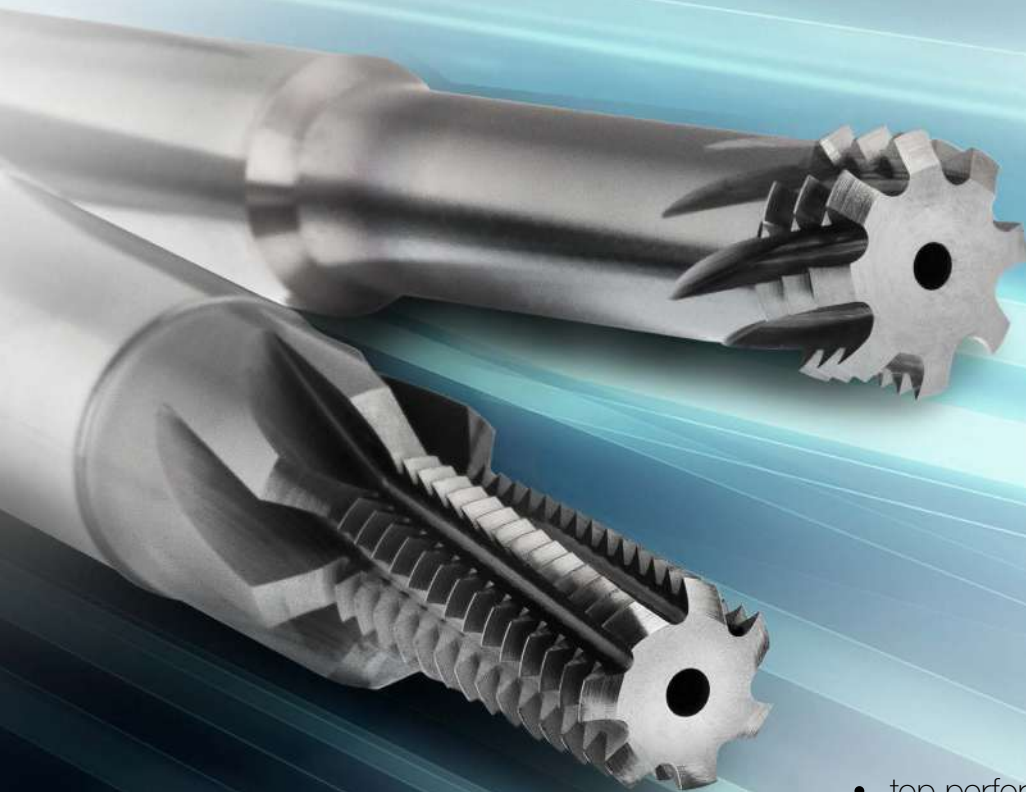


GÜHRING

RAPID
THREAD MILLING
WITH HIGH-END PERFORMANCE



- top performance thread milling up to 1300 N/mm²
- up to 50% reduced cycle time
- increase in tool life by up to 100%
- reliable machining and even higher process safety

SC-LINE Thread milling cutters

GÜHRING – YOUR WORLDWIDE PARTNER

SC-MTM3 SP

MICRO-THREAD MILLING CUTTERS

With regard to process reliability and thread quality thread milling is the leading process for the production of threads. Thanks to the SC-MTM3 SP's optimised geometry with more cutting edges SC-MTM3 SP machines considerably faster. The result is faster machining times, even in small diameter ranges and in materials up to 1300 N/mm².



Increased number of cutting edges

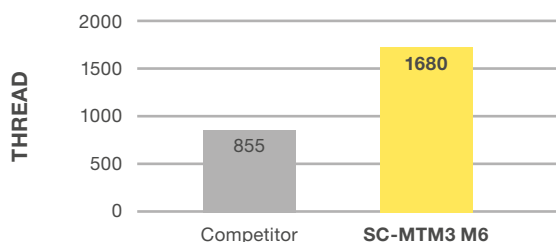
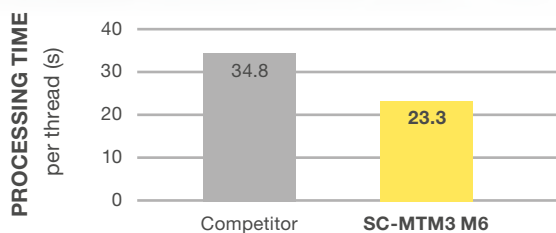
With up to eight cutting edges **SC-MTM3 SP** can machine considerably faster. **The machining time is reduced by up to 50 %** – also in the micro machining sector.

Left cutting geometry

Thanks to a new left cutting geometry up to 100 % more tool life can be achieved, especially with climb milling.

Increased wear resistance

Thanks to the combination of a new carbide, TiCN-coating and new tool geometry threads can be produced longer true to gauge. **An offset correction is only required much later.**



Component: Housing

Thread dimension: M6x(1) – 6H

Thread depth: 14 mm

Tool: SC-MTM3 SP, M6, 2.5xD, with IC, TiCN-coated, Z = 6

Material: VA, 1.4301

Coolant: soluble oil 7 %

Parameter: $v_c = 60$ m/min, $f_z = 0.03$ mm [climb milling]

Comment: tool is left-fluted, LH cutting [M4 counter clockwise]

- **1680 threads with only one CNC offset correction**
- **no crumbling**
- **improved surface finish quality**



Micro thread milling cutters



P	•
M	•
K	•
N	•
S	•
H	≤ 55

M1.6 - M3 with 2 cooling grooves • with internal coolant ≥ M3.5

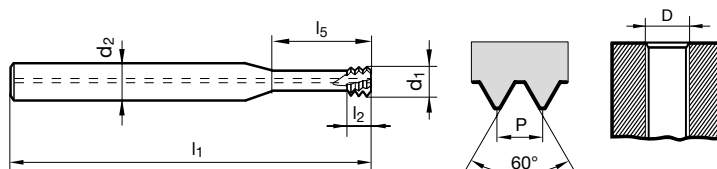
Tool material **Solid carbide**

Surface

Type SC-MTM3-SP

Internal cooling

Shank form HA



Company std.

Article no. **4001**

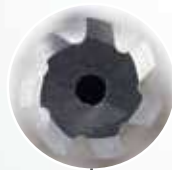
Discount group **108**

D	P	d1	d2	l1	l2	l5	Z	Code no.	Availability
	mm	mm	mm	mm	mm	mm			
M1,6	0.350	1.200	3.000	39.000	1.100	4.000	3	1.600	•
M1,8	0.350	1.400	3.000	39.000	1.100	4.500	4	1.800	•
M2	0.400	1.550	3.000	39.000	1.200	5.000	4	2.000	•
M2,5	0.450	1.950	3.000	39.000	1.400	6.500	4	2.500	•
M3	0.500	2.400	3.000	39.000	1.500	8.000	5	3.000	•
M3,5	0.600	2.800	6.000	58.000	1.800	9.000	5	3.500	•
M4	0.700	3.200	6.000	58.000	2.100	11.000	5	4.000	•
M5	0.800	4.000	6.000	58.000	2.400	13.500	6	5.000	•
M6	1.000	4.800	6.000	58.000	3.000	16.000	6	6.000	•
M8	1.250	5.950	6.000	58.000	3.800	21.000	7	8.000	•
M10	1.500	7.800	8.000	73.000	4.500	26.000	7	10.000	•
M12	1.750	9.000	10.000	84.000	5.300	31.000	7	12.000	•
M16	2.000	11.800	12.000	90.000	6.000	41.000	8	16.000	•
M20	2.500	15.000	16.000	105.000	7.500	51.000	8	20.000	•

SC-TMC SP

THREAD MILLING CUTTERS WITH 45° CHAMFER

The SC-TMC SP thread milling cutter distinguishes itself thanks to the combination of countersinking and thread milling. The tool impresses thanks to very smooth running and low lateral forces. Thanks to additional cutting edges SC-TMC SP can produce threads considerably quicker and scores with increased tool life.



Increased number of cutting edges

Up to eight cutting edges and optimised geometry: **SC-TMC SP can almost halve the machining time.**

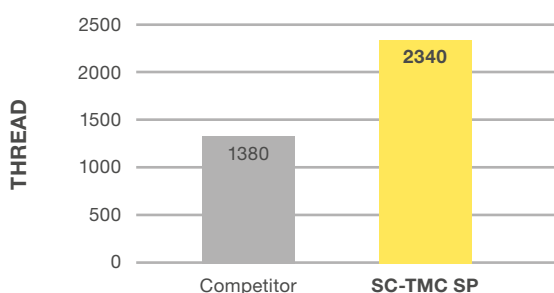
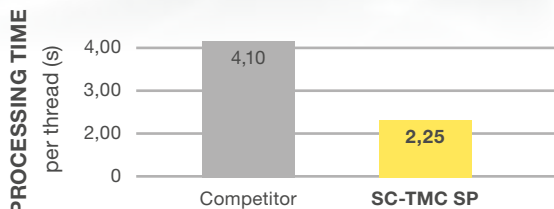
New geometry

Thanks to the new geometry the tool stabilises itself significantly during the machining process. In combination with climb milling a significantly higher process reliability and up to 100% longer tool life is achieved.



Increased wear resistance

Thanks to the combination of a new carbide, AlCrN-coating and a special tool geometry threads can be produced longer true to gauge. **An offset correction is only required much later.**



Component: Flange

Thread dimension: M6x(1) – 6H

Thread depth: 12.5 mm

Tool: SC-TMC SP, M6, 2xD, with IC, Z = 6

Material: 42CrMo4

Coolant: soluble oil 8 %

Parameter: $v_c=90$ m/min, $f_z=0.025$ mm [conventional milling]

- **2340 threads with only two CNC offset corrections**
- **no crumbling**
- **very high process reliability**



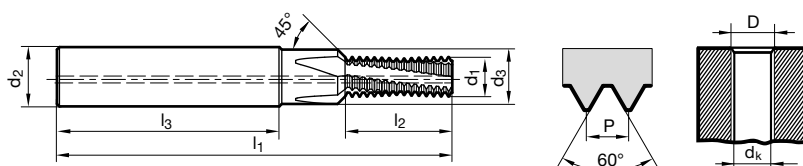
Thread milling cutters with chamfer for ISO metric threads



P	•
M	•
K	•
N	○
S	○
H	

with internal coolant ≥ M4

Tool material	Solid carbide
Surface	P
Type	SC-TMC-SP
Internal cooling	
Shank form	HB



Company std.

Article no.

4000

Discount group

108

D	P	d1	d2	d3	dk	l1	l3	l2	Z	Code no.	Availability
mm	mm	mm	mm	mm	mm	mm	mm	mm			
M3	0.500	2.300	6.000	3.400	2.50	48.000	36.000	6.800	5	3.000	•
M4	0.700	3.100	6.000	4.500	3.30	48.000	36.000	8.800	5	4.000	•
M4 x 0,5	0.500	3.100	6.000	4.500	3.50	48.000	36.000	8.800	5	4.003	•
M5	0.800	4.000	6.000	5.500	4.20	54.000	36.000	10.800	5	5.000	•
M5 x 0,5	0.500	4.000	6.000	5.500	4.50	54.000	36.000	10.800	5	5.003	•
M6	1.000	4.700	8.000	6.600	5.00	62.000	36.000	13.500	6	6.000	•
M6 x 0,5	0.500	4.700	8.000	6.600	5.50	62.000	36.000	12.800	6	6.003	•
M6 x 0,75	0.750	4.700	8.000	6.600	5.20	62.000	36.000	13.100	6	6.004	•
M8	1.250	6.300	10.000	9.000	6.80	74.000	40.000	18.100	7	8.000	•
M8 x 1	1.000	6.300	10.000	9.000	7.00	74.000	40.000	17.500	7	8.005	•
M10	1.500	7.800	12.000	11.000	8.50	80.000	45.000	21.800	7	10.000	•
M10 x 1	1.000	7.800	12.000	11.000	9.00	80.000	45.000	21.500	7	10.005	•
M10 x 1,25	1.250	7.800	12.000	11.000	8.80	80.000	45.000	21.900	7	10.006	•
M12	1.750	9.500	14.000	13.500	10.20	90.000	45.000	25.400	7	12.000	•
M12 x 1	1.000	9.500	14.000	13.500	11.00	90.000	45.000	25.500	7	12.005	•
M12 x 1,5	1.500	9.500	14.000	13.500	10.50	90.000	45.000	26.300	7	12.007	•
M14	2.000	10.800	16.000	15.500	12.00	102.000	48.000	31.000	7	14.000	•
M14 x 1,5	1.500	10.800	16.000	15.500	12.50	102.000	48.000	30.800	7	14.007	•
M16	2.000	12.700	18.000	17.500	14.00	102.000	48.000	35.000	8	16.000	•
M16 x 1,5	1.500	12.700	18.000	17.500	14.50	102.000	48.000	33.800	8	16.007	•



APPLICATION EXAMPLE **SC-TMC SP**

Component:	Lever
Thread dimension:	M6x(1), depth 12 mm, through hole
Tool:	Article 4000_SC-TMC M6 2xD SP
Material:	1.2316
Parameter:	$v_c = 80$ m/min, $f_z = 0.02$ mm (conventional milling)
Coolant:	soluble oil 8%
Tool life:	1870 threads
Machining time:	3.2 seconds

- > **45% faster machining time**
- > **38% longer tool life**



APPLICATION EXAMPLE **SC-MTM3 SP**

Component:	Plate
Thread dimension:	M6x(1), depth 11 mm, blind hole
Tool:	Article 4001_SC-MTM3 M6 2,5xD SP
Material:	1.4433
Parameter:	$v_c = 60$ m/min, $f_z = 0.025$ mm (climb milling)
Coolant:	soluble oil 8%
Tool life:	1570 threads
Machining time:	22.3 seconds

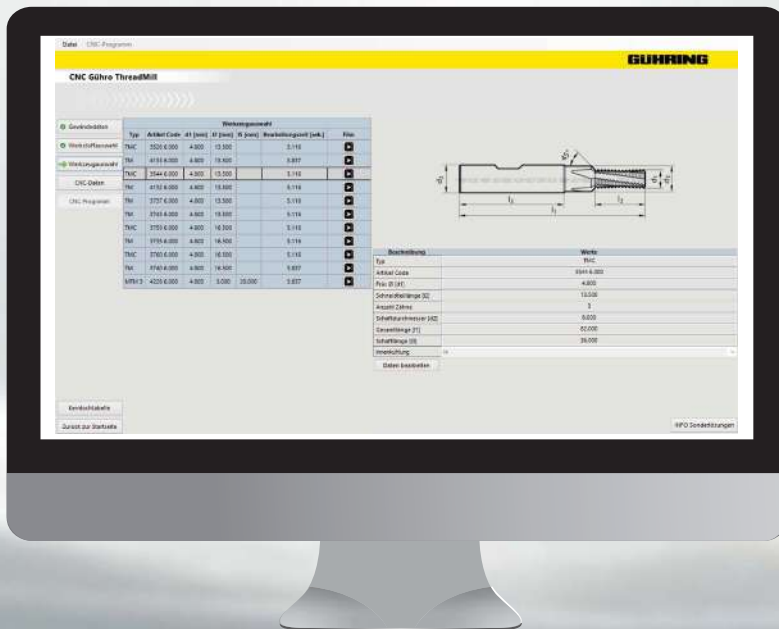
- > **35% faster machining time**
- > **85% longer tool life**

CNC Gühro ThreadMill



Free programming software

for thread milling cutters and drill thread milling cutters



In order to make the machining with Gühring thread milling cutters even more user friendly, we have developed the intuitive "CNC Gühro Thread Mill".

"CNC Gühro Thread Mill" is available free-of-charge. Simply download it from our homepage www.guehring.de.

To the optimal CNC programme in five steps

1. Specify the thread data
Select from all current thread standards
2. Select the material
You are always referred to the optimal parameters
3. Select the tool
Technical data, drawing, machining time and video simplify selection
4. Record CNC data
Enter required milling strategy and parameters
5. Receive CNC programme with code and data sheet
Programming data (Sinumerik, Haidenhain, FANUC, Philips, Mazatrol or Hurco) are imported and automatically recognised

APPLICATION RECOMMENDATIONS

SC-MTM3 2.5xD [Please note, M4 counter clockwise]

ISO	Material group	Hardness	Example materials	Material no.	Cutting speed v _c (m/min)
P	P1 Structural/free-cutting steels, unalloyed heat-treatable-/ case hardened steels	< 800 N/mm ²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	100
	P2 Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm ²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	90
	P3 Alloyed heat-treatable steels, heat-treatable steels, high speed steels	800-1200 N/mm ²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	80
M	M1 Stainless steel sulfured, austenitic	< 1000 N/mm ²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	65
	M2 Stainless and acid-resit. steel steels, martensitic	< 1000 N/mm ²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	60
	M3 Duplex and super duplex	< 1300 N/mm ²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWn25-7-4	1.4462 1.441 1.4501	55
K	K1 Cast iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.603	140
	K2 Spher. graph. iron and mall. cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.704 0.706 0.707	120
	K3 ADI, GGV	1000 N/mm ² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		100
N	N1 Aluminium and wrought alloys	< 450 N/mm ²	Al99,5H AlMgSi1 AlZn4,5Mg	3.025 3.2315 3.4335	280
	N2 Aluminium- cast alloys	< 600 N/mm ²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	250
	N3 Magnesium alloys	< 500 N/mm ²	GDMgAl8Zn1	3.5812.08	200
	N4 Copper and copper alloys	long-chipping short-chipping	CuZn20 CuZn37Pb0,5 CuZn39Pb2 CuZn43Pb2	2.025 2.0332 2.038 2.041	140
	N5 Copper special alloys	< 1400 N/mm ²	Ampco		130
	N6 Plastics [thermoplastics, duroplastics]	long-chipping short-chipping	PMMA, POM,PVC Pertinax		300
S	S1 Titanium und titanium alloys	< 1200 N/mm ²	Titanium TiAl5Sn2 TiAl6V4	3.7025 3.7115 3.7165	55
	S2 Nickel, cobalt, iron alloys	< 1400 N/mm ²	Hasteloy C4 Inconel 718 Nimonic	2.461 2.4668 2.4634	40
H	H1 H2 High tensile steels, hardened steels	45-55 HRC 55-62 HRC	Hardox PM30		50 x

Please note:

The cutting values specified in the respective columns are guide values, they have to be adapted according to application conditions (material, lubrication, tool clamping, machine etc.)

Depending on the machining task the optimal cutting values can differ from those in the table by up to ±30%!



Type SC-MTM3 SP



Milling part diameter [d1] / feed per tooth [fz] [climb milling]													
Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø12	Ø14	Ø16	
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.008	0.015	0.02	0.025	0.03	0.03	0.03	0.035	0.04	0.04	0.045	0.05	0.055	●●
0.008	0.015	0.02	0.025	0.03	0.03	0.03	0.035	0.04	0.04	0.045	0.05	0.055	●●
0.008	0.015	0.02	0.025	0.03	0.03	0.03	0.035	0.04	0.04	0.045	0.05	0.055	●●
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.01	0.02	0.02	0.025	0.03	0.03	0.035	0.035	0.04	0.045	0.05	0.055	0.06	●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
0.01	0.02	0.025	0.03	0.035	0.04	0.045	0.05	0.055	0.06	0.065	0.07	0.075	●●
0.005	0.007	0.012	0.015	0.02	0.025	0.03	0.035	0.035	0.04	0.045	0.045	0.05	●●
0.005	0.007	0.012	0.015	0.02	0.025	0.03	0.035	0.035	0.04	0.045	0.045	0.05	●●
0.005	0.008	0.01	0.012	0.015	0.02	0.025	0.025	0.03	0.03	0.035	0.04	0.045	●●
x	x	x	x	x	x	x	x	x	x	x	x	x	○

- optimally suited
- suited
- not suitable

APPLICATION RECOMMENDATIONS

SC-TMC SP 2xD IC

ISO	Material group	Hardness	Example materials	Material no.	Cutting speed v_c (m/min)	
P	P1	< 800 N/mm ²	S235JR	1.0037	100	
			C15	1.0401		
			11SMnPb30	1.0718		
	P2	800 -1000 N/mm ²	S355J2	1.0577	90	
			C60	1.0601		
			31CrMo12	1.8515		
P3	800-1200 N/mm ²	42CrMo4	1.7225	80		
		36CrNiMo4	1.6511			
		X36CrMo17	1.2316			
		HS 6-5-2	1.3343			
M	M1	< 1000 N/mm ²	X5CrNi18-10	1.4301	60	
			X6CrNiTi18-10	1.4571		
			X8CrNiS18-9	1.4305		
	M2	< 1000 N/mm ²	X17CrNi16-2	1.4057	55	
			X90CrMoV18	1.4112		
	M3	Duplex and super duplex	< 1300 N/mm ²	X2CrNiMoN22-5-3	1.4462	50
X2CrNiMoN25-7-4				1.441		
K	K1	300 HB	EN-GJL-150	0.6015	120	
			EN-GJL-250	0.6025		
			EN-GJL-300	0.603		
	K2	Spher. graph. iron and mall. cast iron	350 HB	EN-GJS-400-15	0.704	100
				EN-GJS-600-3	0.706	
	K3	ADI, GGV	1000 N/mm ² 350 HB	EN-GJS1000-5	0.707	90
EN-GJV250						
N	N1	< 450 N/mm ²	Al99,5H	3.025	x	
			AlMgSi1	3.2315		
			AlZn4,5Mg	3.4335		
	N2	Aluminium- cast alloys	< 600 N/mm ²	GD-AlSi5Cu1Mg	3.2134	x
				GD-AlSi8Cu3	3.2162	
				G-AlSi9Mg	3.2373	
N3	Magnesium alloys	< 500 N/mm ²	G-AlSi12	3.2581	x	
			GDMgAl8Zn1	3.5812.08		
N4	Copper and copper alloys	long-chipping	CuZn20	2.025	90	
		short-chipping	CuZn37Pb0,5	2.0332		
N5	Copper special alloys	< 1400 N/mm ²	CuZn39Pb2	2.038	70	
			CuZn43Pb2	2.041		
N6	Plastics [thermoplastics, duroplastics]	long-chipping	Ampco		x	
		short-chipping	PMMA, POM,PVC			
S	S1	< 1200 N/mm ²	Pertinax		55	
			Titanium	3.7025		
			TiAl5Sn2	3.7115		
	S2	Nickel, cobalt, iron alloys	< 1400 N/mm ²	TiAl6V4	3.7165	45
Hasteloy C4				2.461		
H	H1 H2	45-55 HRC 55-62 HRC	Inconel 718	2.4668	x	
			Nimonic	2.4634		
			Hardox		x	
			PM30		x	

Please note:

The cutting values specified in the respective columns are guide values, they have to be adapted according to application conditions (material, lubrication, tool clamping, machine etc.)

Depending on the machining task the optimal cutting values can differ from those in the table by up to ±30%!



Type SC-TMC SP



Milling part diameter [d1] / feed per tooth [f _z] [conventional milling]											
Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8	Ø9	Ø10	Ø12	Ø14	
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
0.01	0.015	0.02	0.02	0.025	0.025	0.025	0.03	0.03	0.035	0.04	●●
0.01	0.015	0.02	0.02	0.025	0.025	0.025	0.03	0.03	0.035	0.04	●●
0.01	0.015	0.02	0.02	0.025	0.025	0.025	0.03	0.03	0.035	0.04	●●
0.005	0.01	0.015	0.015	0.02	0.02	0.02	0.025	0.025	0.03	0.03	●●
0.005	0.01	0.015	0.015	0.02	0.02	0.02	0.025	0.025	0.03	0.03	●●
0.005	0.01	0.015	0.015	0.02	0.02	0.02	0.025	0.025	0.03	0.03	●●
0.01	0.02	0.025	0.03	0.03	0.035	0.04	0.04	0.045	0.05	0.06	●●
0.01	0.02	0.025	0.03	0.03	0.035	0.04	0.04	0.045	0.05	0.06	●●
0.01	0.02	0.025	0.03	0.03	0.035	0.04	0.04	0.045	0.05	0.06	●●
x	x	x	x	x	x	x	x	x	x	x	○
x	x	x	x	x	x	x	x	x	x	x	○
x	x	x	x	x	x	x	x	x	x	x	○
0.01	0.015	0.02	0.02	0.025	0.025	0.025	0.03	0.03	0.035	0.04	●●
0.005	0.01	0.015	0.015	0.02	0.02	0.02	0.025	0.025	0.03	0.035	●●
x	x	x	x	x	x	x	x	x	x	x	○
0.01	0.015	0.015	0.02	0.025	0.025	0.025	0.03	0.03	0.035	0.035	●●
0.005	0.01	0.01	0.015	0.02	0.02	0.02	0.025	0.025	0.03	0.03	●
x	x	x	x	x	x	x	x	x	x	x	○
x	x	x	x	x	x	x	x	x	x	x	○

- optimally suited
- suited
- not suitable



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