GUHRING

NEW

Programming software

for thread milling cutters and drill thread milling cutters

CNC Gühro ThreadMill

- Thread milling cutters with and without chamfer
- Universal thread milling cutters
- Drill/thread milling cutters
- Micro thread milling cutters
- Thread milling cutters for hardened steels

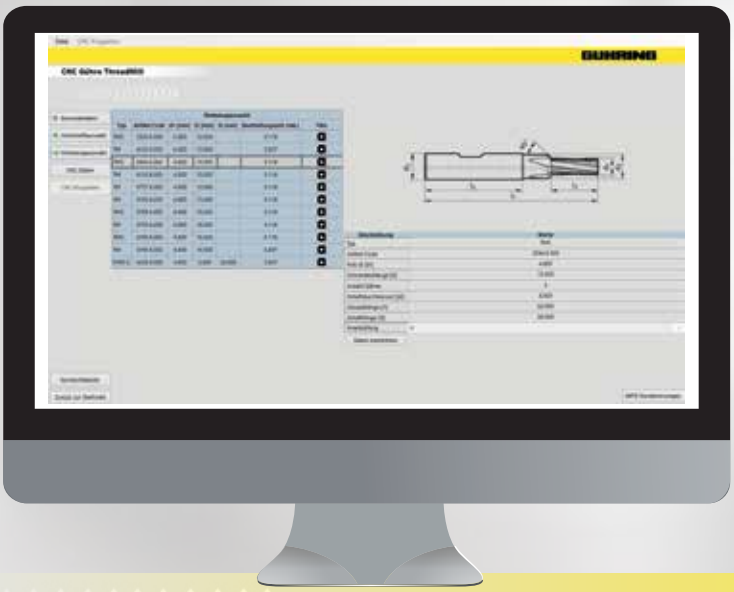
Solid carbide thread milling cutters

GUHRING – YOUR WORLD-WIDE PARTNER

THREAD MILL PROGRAM GENERATOR

Complimentary programming software
for thread milling cutters and drill thread milling cutters

CNC Gühro ThreadMill



In an effort to make using Guhring thread mills even more user-friendly, we have developed the intuitive and complimentary “CNC Gühro Threadmill” software.

“CNC Gühro Thread Mill” is available for download from our homepage **www.guhring.com.**

Five steps to the optimal CNC program

1. Specify the thread data
UNC, UNF, Metric, Metric Fine, UN, etc.

2. Select the material you are threading
This will optimize the feeds and speeds

3. Select the thread mill needed
Every option Guhring offers for your application is listed, along with line drawings, part numbers, and videos of the tools in operation

4. Define your milling strategy
Climb or conventional, number of passes, and language; then select from one of our pre-loaded post processors (Sinumerik, Heidenhain, Fanuc, Philips, Mazatrol or Hurco)

5. Review your data
Email, print or transfer the newly created thread mill program

with HB shank flat

MTMH 3 Z – **Micro drill/thread milling**

p. 13
p. 20

Universally applicable in unhardened and hardened materials up to 66 Rc
No core hole necessary, machine with coolant or dry

Thread types: Internal UNC, UNF, M, G (BSPP)

NEW

with round shank

MTM 3 SP – **Micro thread milling**

p. 14

Thread size and pitch are predetermined

(3xD), sol. carb.
Thread types: Internal UNC, UNF, UNJC, UNJF, M, MF, MJ, G

with round shank

MTMH 3 SP – **Micro thread milling**

p. 18

Machining of hardened steels from 45 HRC – 65 HRC

(2xD – 3xD) M2 – M12, solid carbide
Thread types: Internal M

with round shank

SC MTM3 SP – **Micro thread milling**

p. 19

Applicable in unhardened and hardened materials up to 55 Rc

Thread types: Internal M

NEW

with round shank

MTM 1 SP – **Micro thread milling**

p. 21

Universal production of nominal thread diameters

(3xD) M1.4 – M10, solid carbide
Thread types: Internal M

NEW

with round shank
with HB shank flat

TM SP – **Thread milling cutters**

p. 26

Without chamfer

Simple option for thread milling one thread size
Thread types: Internal UNC, UNF, M MF, NPT, G (BSPP), Rc (BSPT)

with round shank
with HB shank flat

TMC SP – **Thread milling cutters**

p. 36

With 45° chamfer

High productivity thanks to countersinking and thread milling with one tool, stable machining and low lateral forces.
Thread types: Internal UNC, UNF, M, MF, G (BSPP)

with HB shank flat

SC TMC SP – **Thread milling cutters**

p. 42

With 45° chamfer

New geometry, increased stability, reduced cycle times, and longer tool life.
Thread types: Internal M, MF

NEW

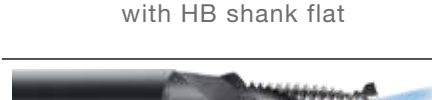
with round shank
with HB shank flat

TMU SP – **Universal thread milling cutter**

p. 46

With recessed neck

For different thread sizes with equal pitch, i.e. thread M30x1.5, milling cutter Ø12xM1.5, Ø16xM1.5 or Ø20xM1.5
Thread types: Internal UNC, UNF, M, MF, NPT, G (BSPP) External M, MF, NPT, G (BSPP)



with round shank

DTMC SP – **Drill thread milling**

p. 52

With 2 flutes and 45° chamfer

High productivity thanks to drilling, countersinking and thread milling one thread size with only one tool. Application only in aluminum, cast iron (GG-GGG), brass and plastics.
Thread types: Internal UNC, UNF, M, MF

TECHNICAL SECTION

p. 71

Guhring Reconditioning

Maximum economic efficiency
thanks to refurbishing to original quality

Even the most wear-resistant tool will wear sometime under heavy stresses.
Thanks to the refurbishment to original geometries and coatings Guhring manages to reproduce the original performance of the tool.

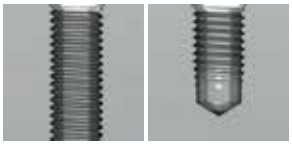
Re-grinding

In our service centers, tools are re-ground on the front rake face according to the degree of wear.
According to width of wear marks the re-grind service is possible two or three times (from milling part diameter d1 ≥ 5.0 mm).

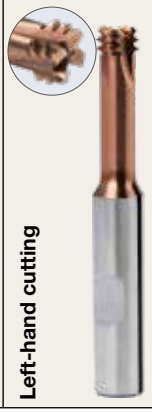
In order to re-define the milling portion diameter, the number of re-grinds is indicated by a notch on the end of the shank. This means every notch is assigned to a diameter and re-etched.

Re-coating

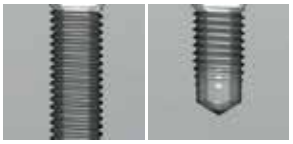
If a thread mill was enhanced with a coating, the tool is re-coated following the re-grind. This way, not only the wear- and corrosion-protection as well as the glide characteristics are re-produced but also the tool life prolonged.



CARBIDE MICRO THREAD MILLING CUTTERS THROUGH HOLES AND BLIND HOLES

Thread depth	3 x Dia.	3 x Dia.	3 x Dia.	2.5 x Dia.	3 x Dia.
Type	MTM 1 SP	MTM 3 SP	MTMH 3 SP	SC-MTM3 SP	MTMH3 Z
Surface finish	TiCN*	TiCN*	TiAlN	TiCN*	TiSiN‡
	** TiCN tools will transition to Sirius coating as stock is replenished*			*‡ TiSiN tools will transition to Perrox*	
Coolant	External	External	External	External	External
h6 Shank	Metric HA	Metric HA	Metric HA	Metric HA	Metric HB
				 Left-hand cutting	 Left-hand cutting
Thread type	Series no.				
UNC		**4223** p. 14			**4700** p. 13
UNF		**4223** p. 14			**4700** p. 13
UNJC		**4215** p. 15			
UNJF		**4215** p. 15			
NPT					
NPTF					
Metric	**4225** p. 21	**4226** p. 16	**4227** p. 18	**4001** p. 19	**4002** p. 20
Metric Fine	**4225** p. 21				
Metric “J”		**4214** p. 17			
G (BSPP)		**4228** p. 22			**4780** p. 23
Rc (BSPT)					

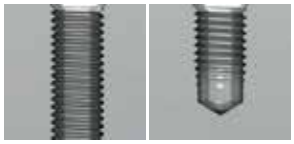
STI / EG threads can typically be produced with all thread milling cutter types & dimensions



CARBIDE THREAD MILLING CUTTERS WITHOUT CHAMFER THROUGH HOLES AND BLIND HOLES

Thread depth	2 x Dia.	2 x Dia.	2 x Dia.	2 x Dia.	2 x Dia.	2.5 x Dia.	2.5 x Dia.
Type	TM	TM	TM	TM	TM	TM	TM
Surface finish	TiCN*	TiCN*	TiCN*	TiCN*	TiCN*	TiCN*	TiCN*
	** TiCN coated thread mills will transition to Sirius coating as stock is replenished*						
Coolant	External	External	External	Internal	Internal	Internal	Internal
h6 Shank	Fractional HA	Metric HA	Metric HB	Metric HA	Metric HB	Metric HA	Metric HB
							
Thread type	Series no.						
UNC	**4128** p. 26			**4134** p. 28	**4135** p. 28		
UNF	**4129** p. 27			**4136** p. 29	**4137** p. 29		
UNJC							
UNJF							
NPT	**4130** p. 60			**3753** p. 62	**3754** p. 62		
NPTF	**4131** p. 61			**3756** p. 63	**3757** p. 63		
Metric		**4132** p. 30	**4133** p. 30	**3737** p. 31	**3743** p. 31	**3735** p. 32	**3740** p. 32
Metric Fine				**3737** p. 31	**3743** p. 31		
Metric “J”							
G (BSPP)				**3745** p. 67	**3748** p. 67		
Rc (BSPT)			**4770** p. 70				

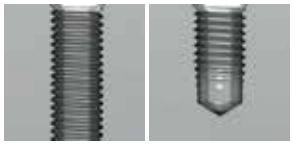
STI / EG threads can typically be produced with all thread milling cutter types & dimensions



CARBIDE THREAD MILLING CUTTERS WITH CHAMFER THROUGH HOLES AND BLIND HOLES

Thread depth	2 x Dia.	2 x Dia.	2.5 x Dia.	2.5 x Dia.	2 x Dia.
Type	TMC	TMC	TMC	TMC	SC-TMC SP
Surface finish	TiCN*	TiCN*	TiCN*	TiCN*	AlCrN
	** TiCN coated thread mills will transition to Sirius coating as stock is replenished*				
Coolant	Internal	Internal	Internal	Internal	Internal
h6 Shank	Metric HA	Metric HB	Metric HA	Metric HB	Metric HB
					
Thread type		Series no.			
UNC	**3517** p. 36	**3535** p. 36			
UNF	**3519** p. 37	**3537** p. 37			
UNJC					
UNJF					
NPT					
NPTF					
Metric	**3526** p. 38	**3544** p. 38	**3759** p. 40	**3760** p. 40	**4000** p. 42
Metric Fine	**3528** p. 39	**3546** p. 39	**3762** p. 41	**3763** p. 41	**4000** p. 42
Metric “J”					
G (BSPP)	**3515** p. 68	**3533** p. 68			
Rc (BSPT)					

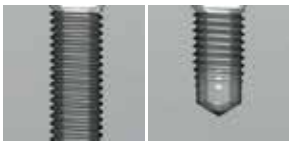
STI / EG threads can typically be produced with all thread milling cutter types & dimensions



CARBIDE UNIVERSAL THREAD MILLING CUTTERS THROUGH HOLES AND BLIND HOLES

Thread depth	Multi Range	Multi Range	Multi Range	Multi Range
Type	TMU	TMU	TMU	TMU
Surface finish	TiCN*	TiCN*	TiCN*	TiCN*
	** TiCN coated thread mills will transition to Sirius coating as stock is replenished*			
Coolant	Internal	Internal	Internal	Internal
h6 Shank	Metric HA	Metric HB	Metric HA	Metric HB
			 External threads	 External threads
Thread type	Series no.			
UNC	**3595** p. 46	**3596** p. 46		
UNF	**3595** p. 46	**3596** p. 46		
UNJC				
UNJF				
NPT	**3768** p. 64	**3769** p. 64	**3768** p. 64	**3769** p. 64
NPTF	**3772** p. 65	**3773** p. 65	**3772** p. 65	**3773** p. 65
Metric	**3541** p. 47	**3556** p. 47	**4162** p. 48	**4163** p. 48
Metric Fine	**3541** p. 47	**3556** p. 47	**4162** p. 48	**4163** p. 48
Metric “J”				
G (BSPP)	**3542** p. 69	**3557** p. 69	**3542** p. 69	**3557** p. 69
Rc (BSPT)				

STI / EG threads can typically be produced with all thread milling cutter types & dimensions



CARBIDE DRILL/THREAD MILLING CUTTERS THROUGH HOLES AND BLIND HOLES

Thread depth	2 x Dia.	2 x Dia.	2 x Dia.	2 x Dia.	2.5 x Dia.	2.5 x Dia.
Type	DTMC	DTMC	DTMC	DTMC	DTMC	DTMC
Surface finish	Uncoated	TiCN*	Uncoated	TiCN*	Uncoated	TiCN*
	** TiCN coated thread mills will transition to Sirius coating as stock is replenished*					
Coolant	External	External	Internal	Internal	Internal	Internal
Shank	Metric HA	Metric HA	Metric HA	Metric HA	Metric HA	Metric HA
27° helix						
Thread type	Series no.					
UNC	**4138** p. 52			**4139** p. 52		
UNF	**4140** p. 53			**4141** p. 53		
UNJC						
UNJF						
NPT						
NPTF						
Metric	**3778** p. 54	**3780** p. 54	**3779** p. 55	**3781** p. 55	**3783** p. 58	**3785** p. 58
Metric Fine	**3790** p. 56	**3792** p. 56	**3791** p. 57	**3793** p. 57		
Metric “J”						
G (BSPT)						
Rc (BSPT)						

GUHRING

CNC Data Sheet

Date 12.11.2019

Machining Task		Material
Thread Dimension	No.8-32 UNC right	Titanium and titanium alloys
Length	0.23 Inch	
countersink ∢ = 90°	No	

Tool		Cutting Values			
Description	MTM3 SP Mikro-Gewindefräser	**Milling**			
Milling cutter diameter	d1 = 0.126 Inch	**Vc**	1772 Inch/min	**n**	4476 1/min
Programmed Radius	0.062 Inch	**fz**	0.001 Inch/tooth		
Order-No	4223_4.166	**Vf**	14.00 Inch/min	**Vm**	3.27 Inch/min

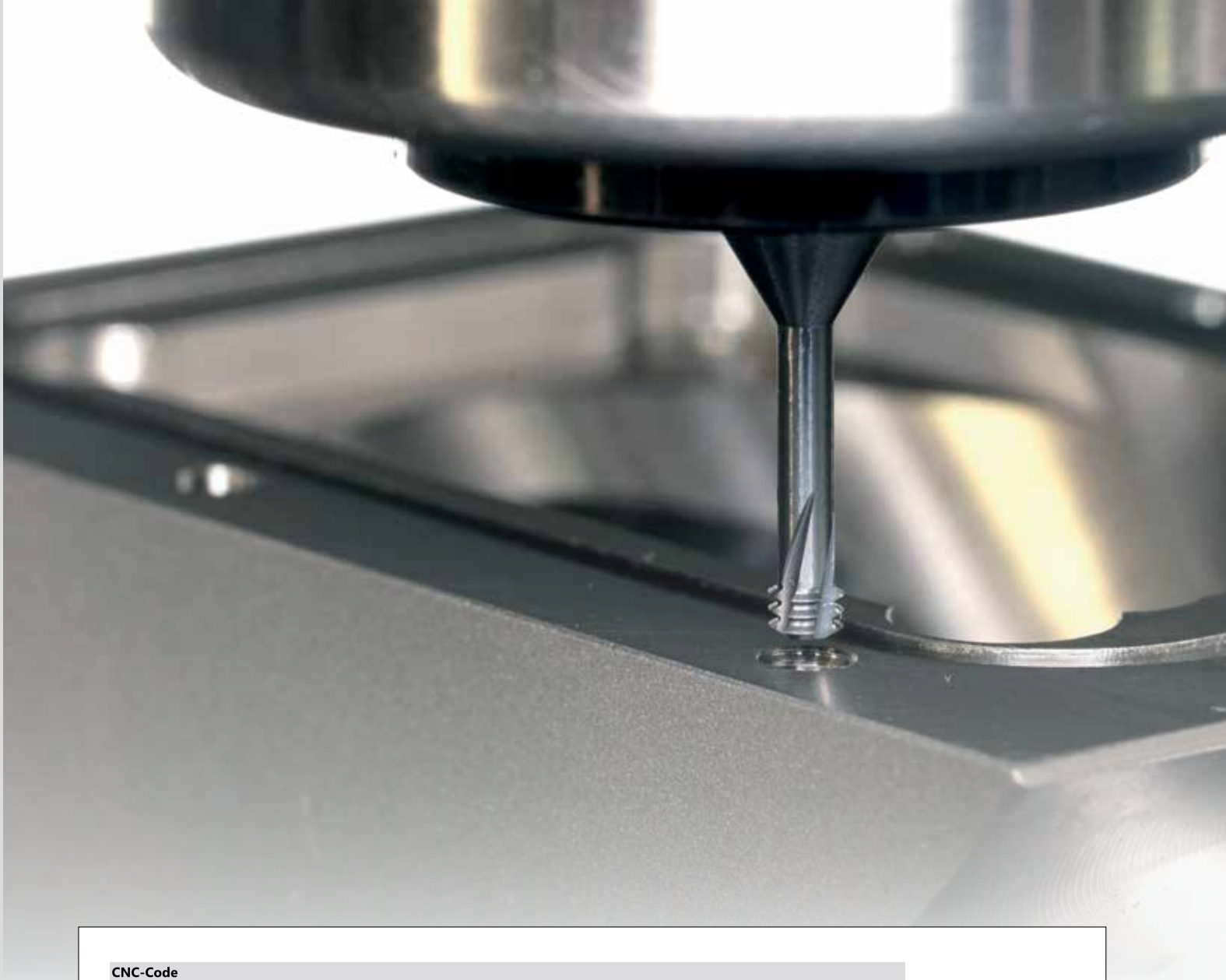
NC-Options		Cycle Time	
Machine Control	Sinumerik [DIN]	**Total Time**	19.19 sec.
Cutting Path	Center point path, incremental		
Milling process	Conventional milling		
No. of passes	One cut		

Note CNC-program serves as a programming example and should be tested by simulation before use on component.

CNC-Code

- Tool= MTM3 SP Mikro-Gewindefräser No.8-32 UNC right
- Material= S1
- Vc=1772 Inch/min
- fz=0.001 Inch/tooth
- Conventional milling
- One cut
- Thread Type= Internal Right-Hand Thread

Attention, for controls that refer to outer path, values in brackets to be used!



CNC-Code

```
N10 M6 T1
N20 G90 G54 G00 X0.0000 Y0.0000
N30 Z0.0787 S4476 M3 M8
N40 G00 Z0.0197
N50 G91
N60 G42 G01 X0.0000 Y0.0630 F1.63 ;(F7.05)
N70 G02 X0.0000 Y-0.1450 I0.0000 J-0.0725 Z-0.0047
N80 G02 X0.0000 Y0.0000 I0.0000 J0.0820 Z-0.0313 F3.27 ;(F14.10)
N90 G02 X0.0000 Y0.0000 I0.0000 J0.0820 Z-0.0313
N100 G02 X0.0000 Y0.0000 I0.0000 J0.0820 Z-0.0313
N110 G02 X0.0000 Y0.0000 I0.0000 J0.0820 Z-0.0313
N120 G02 X0.0000 Y0.0000 I0.0000 J0.0820 Z-0.0313
N130 G02 X0.0000 Y0.0000 I0.0000 J0.0820 Z-0.0313
N140 G02 X0.0000 Y0.0000 I0.0000 J0.0820 Z-0.0313
N150 G02 X0.0000 Y0.0000 I0.0000 J0.0820 Z-0.0313
N160 G02 X0.0000 Y0.1450 I0.0000 J0.0725 Z-0.0047
N170 G40 G01 X0.0000 Y-0.0630
N180 G90
N190 G00 Z0.0787 M9
N200 M30
```

Attention, for controls that refer to outer path, values in brackets to be used!

GUHRING

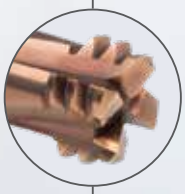
NEW

MTMH3-Z 2.5xD

HELICAL DRILL/THREAD MILLING INTO SOLID MATERIAL UP TO 66 HRC

The new helical drill/thread milling cutter for high-strength and hardened steels up to 66 HRC combines core hole and thread production in one tool. The MTMH3-Z guarantees process reliability and true to gauge threads.

Thanks to the special face geometry, the threaded hole is generated from solid using a single tool with a safe, reliable process.



Thanks to the **left cutting geometry** the tool stabilizes itself during the climb milling process – perfect, true to gauge threads up to 66 HRC are guaranteed.

The MTMH3-Z is made of a **special fine-grained carbide**, which is characterized by its high hardness and is optimally suited for hard machining.

Two oil grooves on the shank ensure optimum cooling with emulsion or air.

- process reliability guaranteed
- excellent machining results in dry and wet machining
- core holes and threads in one step: significantly shorter cycle and setting time
- universally applicable in unhardened and hardened materials up to 66 HRC

Micro drill/thread milling cutters - UNC/UNF - Left hand cutting

Series **4700**

3xD

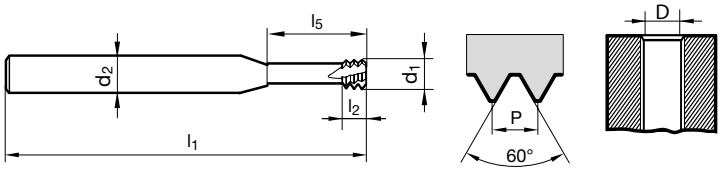
NEW

Tool material	**Solid Carbide**
Coating	TiSiN ‡
Type	MTMH3-Z
Shank	HB
Coolant delivery	oil grooves on shank

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	●

●=Optimal ○=Secondary

coolant grooves ground on the shank for use with internal coolant spindles



‡ *TiSiN coated thread mills will transition to Perrox as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code No.	EDP Number
UNF No. 1	72	1.40	3.00	39.00	1.10	5.00	4	1.853	9047000018530
UNC No. 1+UNF No. 2	64	1.40	3.00	39.00	1.20	5.00	4	1.854	9047000018540
UNC No. 2+UNF No. 3	56	1.60	3.00	39.00	1.40	5.50	4	2.184	9047000021840
UNC No. 3+UNF No. 4	48	1.90	3.00	39.00	1.60	6.50	4	2.515	9047000025150
UNC No. 4	40	2.10	6.00	58.00	1.90	7.50	4	2.845	9047000028450
UNC No. 5+UNF No. 6	40	2.40	6.00	58.00	1.90	8.00	4	3.175	9047000031750
UNC No. 6	32	2.60	6.00	58.00	2.40	9.00	4	3.505	9047000035050
UNF No. 8	36	3.20	6.00	58.00	2.10	10.50	4	4.165	9047000041650
UNC No. 8	32	3.10	6.00	58.00	2.40	10.50	4	4.166	9047000041660
UNF No. 10	32	3.60	6.00	58.00	2.40	12.50	4	4.825	9047000048250
UNC No. 10+UNC No. 12	24	3.60	6.00	58.00	3.20	12.50	4	4.826	9047000048260
UNF No. 12	28	4.10	6.00	58.00	2.70	14.00	4	5.485	9047000054850
UNF 1/4	28	4.80	6.00	58.00	2.70	16.00	4	6.349	9047000063490
UNC 1/4	20	4.80	6.00	58.00	3.80	16.00	4	6.350	9047000063500
UNF 5/16+UNF3/8	24	6.30	8.00	64.00	3.20	20.00	4	7.937	9047000079370
UNC 5/16	18	6.30	8.00	64.00	4.20	20.00	4	7.938	9047000079380
UNC 3/8	16	7.20	8.00	64.00	4.80	24.00	4	9.525	9047000095250
UNF 7/16	20	8.30	10.00	73.00	3.80	28.00	4	11.112	9047000111120
UNC 7/16	14	8.30	10.00	73.00	5.40	28.00	4	11.113	9047000111130
UNF 1/2	20	9.70	10.00	73.00	3.80	31.00	4	12.700	9047000127000
UNC 1/2	13	9.70	10.00	73.00	5.90	31.00	4	12.701	9047000127010
UNF 5/8	18	11.80	12.00	90.00	4.20	40.00	4	15.874	9047000158740
UNC 5/8	11	11.80	12.00	90.00	6.90	40.00	4	15.875	9047000158750

See page 90 for machining parameters

Micro thread milling cutters - UNC/UNF

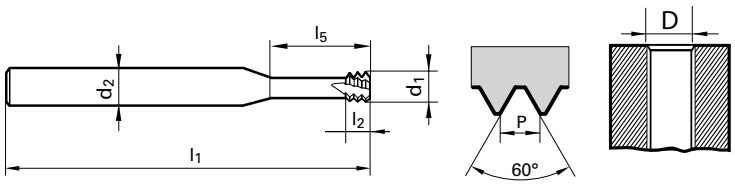
Series **4223**

3xD

Tool material	**Solid Carbide**
Coating	TiCN*
Type	MTM3 SP
Shank	HA
Coolant delivery	external

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	●

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code no.	EDP Number
UNF No. 1	72	1.45	3.00	39.00	1.10	5.80	3	1.853	9042230018530
UNC No. 1 + UNF No. 2	64	1.40	3.00	39.00	1.20	6.00	3	1.854	9042230018540
UNC No. 2 + UNF No. 3	56	1.65	3.00	39.00	1.40	7.00	4	2.184	9042230021840
UNC No. 3 + UNF No. 4	48	1.90	3.00	39.00	1.60	8.00	4	2.515	9042230025150
UNC No. 4	40	2.10	6.00	58.00	1.90	9.00	4	2.845	9042230028450
UNC No. 5 + UNF No. 6	40	2.45	6.00	58.00	1.90	10.00	4	3.175	9042230031750
UNC No. 6	32	2.55	6.00	58.00	2.40	11.00	4	3.505	9042230035050
UNF No. 8	36	3.30	6.00	58.00	2.10	12.00	4	4.165	9042230041650
UNC No. 8	32	3.20	6.00	58.00	2.40	13.00	4	4.166	9042230041660
UNF No. 10	32	3.70	6.00	58.00	2.40	15.00	4	4.825	9042230048250
UNC No. 10 + UNC No. 12	24	3.50	6.00	58.00	3.20	16.00	4	4.826	9042230048260
UNF No. 12	28	4.20	6.00	58.00	2.70	16.00	4	5.485	9042230054850
UNF 1/4	28	5.00	6.00	58.00	2.70	19.60	4	6.349	9042230063490
UNC 1/4	20	4.75	6.00	58.00	3.80	20.00	4	6.350	9042230063500
UNF 5/16 + UNF 3/8	24	6.60	8.00	64.00	3.20	24.00	4	7.937	9042230079370
UNC 5/16	18	6.00	6.00	58.00	4.20	23.00	4	7.938	9042230079380
UNC 3/8	16	6.70	8.00	64.00	4.80	25.00	4	9.525	9042230095250
UNF 7/16	20	8.00	8.00	64.00	3.80	34.60	4	11.112	9042230111120
UNC 7/16	14	7.70	8.00	64.00	5.40	25.00	4	11.113	9042230111130
UNC 1/2	13	9.95	10.00	73.00	5.90	31.00	4	12.701	9042230127010
UNF 5/8	18	12.00	12.00	84.00	4.20	35.00	4	15.874	9042230158740

See page 84 for machining parameters

See page 74 for tap/drill size info

Micro thread milling cutters - UNJC/UNJF

Series **4215**

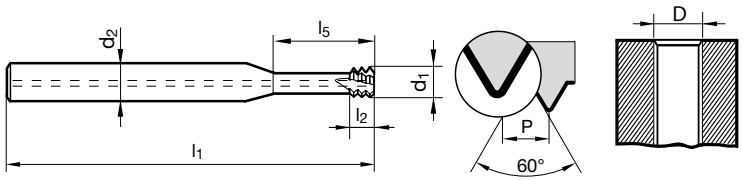
3xD

NEW

Tool material	**Solid Carbide**
Coating	TiCN*
Type	MTM3 SP
Shank	HA
Coolant delivery	axial ≥ UNJF 1/4

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	●

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code no.	EDP Number
‡ UNJC No. 6	32	2.70	6.00	58.00	2.40	11.00	4	3.505	9042150035050
‡ UNJC No. 8 + UNJC No. 10	32	3.30	6.00	58.00	2.40	14.00	4	4.166	9042150041660
‡ UNJC No. 10 + UNJC No. 12	24	3.70	6.00	58.00	3.20	15.00	4	4.826	9042150048260
UNJF 1/4	28	5.10	8.00	64.00	2.70	19.50	4	6.349	9042150063490
UNJC 1/4	20	4.90	6.00	58.00	3.80	19.50	4	6.350	9042150063500
UNJF 5/16 + UNJF 3/8	24	6.70	8.00	64.00	3.20	24.00	4	7.937	9042150079370
UNJC 5/16 + UNJF 9/16	18	6.15	8.00	64.00	4.20	24.00	4	7.938	9042150079380
UNJC 3/8 + UNJF 3/4	16	6.90	8.00	64.00	4.80	26.00	4	9.525	9042150095250
UNJF 7/16	20	8.00	10.00	73.00	3.80	30.00	4	11.112	9042150111120
UNJC 7/16 + UNJF 7/8	14	7.90	10.00	73.00	5.40	30.00	4	11.113	9042150111130
UNJC 1/2	13	9.40	10.00	73.00	5.90	30.00	4	12.700	9042150127000

‡ with internal coolant ≥ UNJF 1/4

See page 84 for machining parameters

See page 74 for tap/drill size info

Micro thread milling cutters for ISO metric

Series **4226**

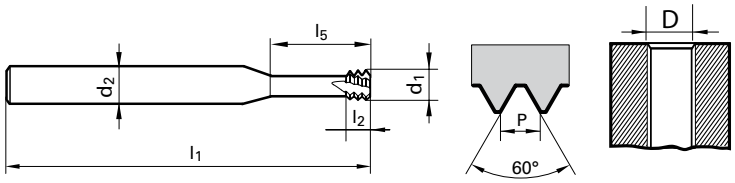
3xD

NEW

Tool material	**Solid Carbide**
Coating	TiCN*
Type	MTM3 SP
Shank	HA
Coolant delivery	external

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	●

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code no.	EDP Number
M1.6	0.35	1.20	3.00	39.00	1.10	4.80	3	1.600	9042260016000
M1.8	0.35	1.40	3.00	39.00	1.10	5.40	3	1.800	9042260018000
M2	0.40	1.55	3.00	39.00	1.20	6.00	4	2.000	9042260020000
M2.5	0.45	1.95	3.00	39.00	1.40	7.50	4	2.500	9042260025000
M3	0.50	2.40	6.00	58.00	1.50	9.50	4	3.000	9042260030000
M3.5	0.60	2.80	6.00	58.00	1.80	11.00	4	3.500	9042260035000
M4	0.70	3.20	6.00	58.00	2.10	12.50	4	4.000	9042260040000
M5	0.80	4.00	6.00	58.00	2.40	16.00	4	5.000	9042260050000
M6	1.00	4.80	6.00	58.00	3.00	20.00	4	6.000	9042260060000
M8	1.25	5.95	6.00	58.00	3.80	24.00	4	8.000	9042260080000
M10	1.50	7.80	8.00	73.00	4.50	33.00	4	10.000	9042260100000
M12	1.75	9.00	10.00	84.00	5.30	38.00	4	12.000	9042260120000
M16	2.00	11.80	12.00	84.00	6.00	35.00	5	16.000	9042260160000
M20	2.50	15.00	16.00	105.00	7.50	51.00	5	20.000	9042260200000

See page 84 for machining parameters

See page 74 for tap/drill size info

Micro thread milling cutters - MJ

Series **4214**

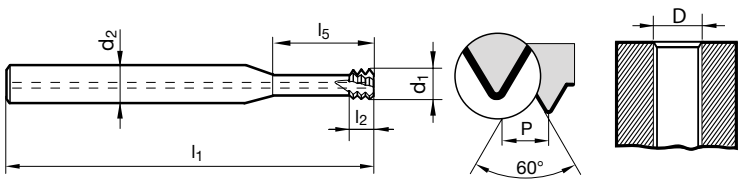
3xD

NEW

Tool material	**Solid Carbide**
Coating	TiCN*
Type	MTM3 SP
Shank	HA
Coolant delivery	axial ≥ MJ5

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	●

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code no.	EDP Number
‡ MJ 3	0.50	2.40	6.00	58.00	1.50	9.50	4	3.000	9042140030000
‡ MJ 4	0.70	3.20	6.00	58.00	2.10	12.50	4	4.000	9042140040000
MJ 5	0.80	3.90	6.00	58.00	2.40	16.00	4	5.000	9042140050000
MJ 6	1.00	4.80	6.00	58.00	3.00	19.00	4	6.000	9042140060000
MJ 8	1.25	6.10	8.00	64.00	3.80	25.00	4	8.000	9042140080000
MJ 10	1.50	8.00	8.00	73.00	4.50	33.00	4	10.000	9042140100000
MJ 12	1.75	9.20	10.00	73.00	5.30	30.00	4	12.000	9042140120000
MJ 16	2.00	10.80	12.00	84.00	6.00	35.00	5	16.000	9042140160000

‡ with internal coolant ≥ MJ5

See page 84 for machining parameters

See page 74 for tap/drill size info

Micro thread milling cutters - Metric

Series **4227**

3xD

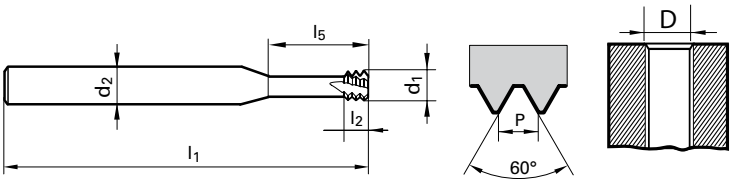
NEW

Tool material	**Solid Carbide**
Coating	TiAlN
Type	MTMH3 SP
Shank	HA
Coolant delivery	external

Material		Suitability
P	Steel	
M	Stainless steel	
K	Cast iron	
N	Aluminum	
S	Ni / Ti alloys	○
H	Hardened steel	●

●=Optimal ○=Secondary

for hard machining 45-65 HRC



D Ø	P mm	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code no.	EDP Number
M2	0.40	1.55	3.00	39.00	1.20	6.00	4	2.000	9042270020000
M2.5	0.45	1.95	3.00	39.00	1.40	7.50	4	2.500	9042270025000
M3	0.50	2.35	6.00	58.00	1.50	9.50	4	3.000	9042270030000
M4	0.70	3.10	6.00	58.00	2.10	12.50	4	4.000	9042270040000
M5	0.80	3.80	6.00	58.00	2.40	16.00	4	5.000	9042270050000
M6	1.00	4.80	6.00	58.00	3.00	20.00	4	6.000	9042270060000
M8	1.25	5.95	6.00	58.00	3.80	24.00	4	8.000	9042270080000
M10	1.50	7.80	8.00	64.00	4.50	23.00	4	10.000	9042270100000
M12	1.75	9.00	10.00	73.00	5.30	26.00	5	12.000	9042270120000

See page 84 for machining parameters

See page 74 for tap/drill size info

Micro thread milling cutters - Metric - Left hand cutting

Series **4001**

2.5xD

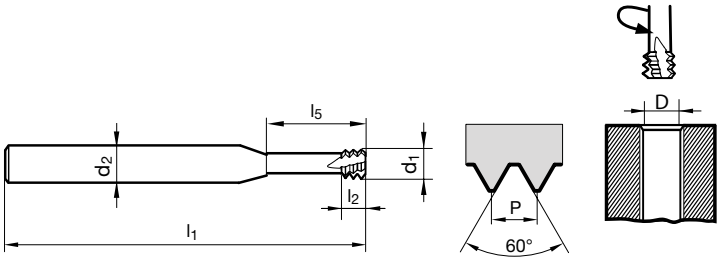
NEW

Tool material	**Solid Carbide**
Coating	TiCN*
Type	SC-MTMH3 SP
Shank	HA
Coolant delivery	axial ≥ M3; oil grooves

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	●

●=Optimal ○=Secondary

coolant grooves ground on the shank for use with internal coolant spindles



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code no.	EDP Number
‡ M1.6	0.35	1.20	3.00	39.00	1.10	4.00	3	1.600	9040010016000
‡ M1.8	0.35	1.40	3.00	39.00	1.10	4.50	4	1.800	9040010018000
‡ M2	0.40	1.55	3.00	39.00	1.20	5.00	4	2.000	9040010020000
‡ M2.5	0.45	1.95	3.00	39.00	1.40	6.50	4	2.500	9040010025000
‡ M3	0.50	2.40	6.00	58.00	1.50	8.00	5	3.000	9040010030000
M3.5	0.60	2.80	6.00	58.00	1.80	9.00	5	3.500	9040010035000
M4	0.70	3.20	6.00	58.00	2.10	11.00	5	4.000	9040010040000
M5	0.80	4.00	6.00	58.00	2.40	13.50	6	5.000	9040010050000
M6	1.00	4.80	6.00	58.00	3.00	16.00	6	6.000	9040010060000
M8	1.25	5.95	6.00	58.00	3.80	21.00	7	8.000	9040010080000
M10	1.50	7.80	8.00	73.00	4.50	26.00	7	10.000	9040010100000
M12	1.75	9.00	10.00	84.00	5.30	31.00	7	12.000	9040010120000
M16	2.00	11.80	12.00	90.00	6.00	41.00	8	16.000	9040010160000
M20	2.50	15.00	16.00	105.00	7.50	51.00	8	20.000	9040010200000

‡ Sizes ≥ M3 with axial coolant; smaller sizes have oil grooves on the shank

See page 87 for machining parameters

See page 74 for tap/drill size info

Helical drill/thread milling cutters - Metric - Left hand cutting

Series **4002**

2.5xD

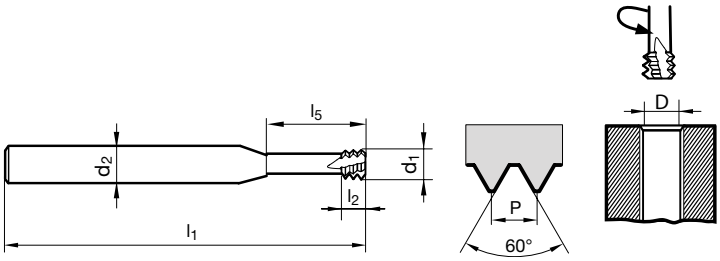
NEW

Tool material	**Solid Carbide**
Coating	TiSiN
Type	MTMH3-Z
Shank	HB
Coolant delivery	oil grooves on shank

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	●

●=Optimal ○=Secondary

coolant grooves ground on the shank for use with internal coolant spindles



‡ *TiSiN coated thread mills will transition to Perrox as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code no.	EDP Number
M2	0.400	1.400	3.000	39.000	1.200	5.000	4	2.000	9040020020000
M2.5	0.450	1.800	3.000	39.000	1.300	6.500	4	2.500	9040020025000
M3	0.500	2.400	6.000	58.000	1.500	7.500	4	3.000	9040020030000
M3.5	0.600	2.700	6.000	58.000	1.800	9.000	4	3.500	9040020035000
M4	0.700	3.100	6.000	58.000	2.100	10.000	4	4.000	9040020040000
M5	0.800	3.800	6.000	58.000	2.400	12.500	4	5.000	9040020050000
M6 / M7	1.000	4.600	8.000	64.000	3.000	15.000	4	6.000	9040020060000
M8 / M9	1.250	6.200	8.000	64.000	3.600	20.000	4	8.000	9040020080000
M10 / M12	1.500	7.500	10.000	73.000	4.500	25.000	4	10.000	9040020100000
M12	1.750	9.000	10.000	73.000	5.200	30.000	4	12.000	9040020120000
M16	2.000	11.500	12.000	90.000	6.000	40.000	4	16.000	9040020160000

See page 90 for machining parameters

Micro thread milling cutters - Universal

Series **4225**

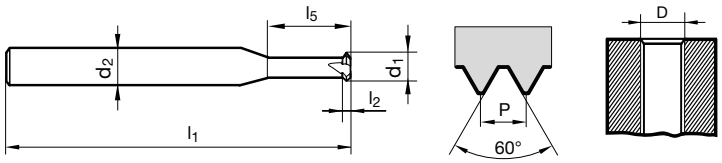
3xD

NEW

Tool material	**Solid Carbide**
Coating	TiCN*
Type	MTM1 SP
Shank	HA
Coolant delivery	external

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P max mm	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code no.	EDP Number
M1.4 - M1.8	0.350	1.05	3.00	39.00	0.40	3.80	3	1.800	9042250018000
M2 - M2.4	0.400	1.50	3.00	39.00	0.40	7.00	3	2.400	9042250024000
M2.5 - M3	0.500	2.00	3.00	39.00	0.50	9.00	4	3.000	9042250030000
M3.5 - M4.5	0.750	2.80	6.00	58.00	0.80	14.00	4	4.500	9042250045000
M5 - M7	1.000	4.00	6.00	58.00	1.00	19.00	4	7.000	9042250070000
M8 - M10	1.500	6.40	6.00	64.00	1.50	24.00	5	10.000	9042250100000

See page 84 for machining parameters

See page 74 for tap/drill size info

Micro thread milling cutters - G (BSPP)

Series **4228**

3xD

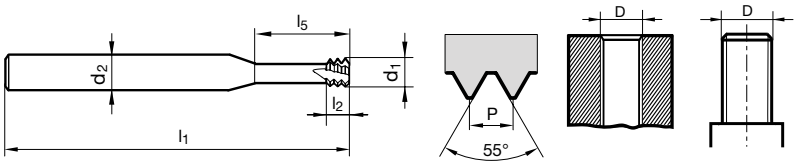
NEW

Tool material	**Solid Carbide**
Coating	TiCN*
Type	MTM3 SP
Shank	HA
Coolant delivery	external

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	●

●=Optimal ○=Secondary

For internal and external threading



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code no.	EDP Number
G1/16 - G1/8	28	6.20	8.00	64.00	2.70	19.50	4	9.728	9042280097280
G1/4 - G3/8	19	9.95	10.00	73.00	4.00	25.00	4	16.662	9042280166620
G1/2 - G7/8	14	11.95	12.00	84.00	5.40	37.00	4	30.201	9042280302010
G1 - G2	11	15.95	16.00	105.00	6.90	44.00	5	59.614	9042280596140

See page 84 for machining parameters

See page 74 for tap/drill size info

Helical drill/thread milling cutters - G (BSPP) - Left hand cutting

Series **4780**

2.5xD

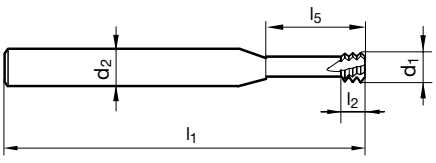
NEW

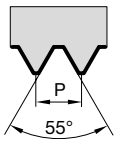
Tool material	**Solid Carbide**
Coating	TiSiN
Type	MTMH3-Z
Shank	HB
Coolant delivery	oil grooves on shank

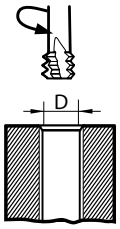
Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	●

●=Optimal ○=Secondary

coolant grooves ground on the shank for use with internal coolant spindles







‡ *TiSiN coated thread mills will transition to Perrox as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code no.	EDP Number
G1/16 - G1/8	28	6.20	8.00	64.00	2.70	19.50	4	9.728	9047800097280
G1/4 - G3/8	19	10.50	12.00	90.00	4.00	35.00	4	16.662	9047800166620
G1/2-G5/8-G3/4-G7/8	14	15.70	16.00	105.00	5.40	50.00	4	26.441	9047800264410

See page 90 for machining parameters

GUHRING

CNC Data Sheet

Date 12.11.2019

Machining Task		Material
Thread Dimension	3/8-16 UNC right	Structural- and free cutting steels, unalloyed
Length	0.50 Inch	tempered-/case hardened steels
countersink ∢ = 90°	No	

Tool		Cutting Values			
Description	TM SP 2xD ohne Senkfase	**Milling**			
Milling cutter diameter	d1 = 0.301 Inch	**Vc**	3543 Inch/min	**n**	3747 1/min
Programmed Radius	0.149 Inch	**fz**	0.002 Inch/tooth		
Order-No	4128_9.525	**Vf**	22.00 Inch/min	**Vm**	4.37 Inch/min

NC-Options		Cycle Time	
Machine Control	Sinumerik [DIN]	**Total Time**	5.59 sec.
Cutting Path	Center point path, incremental		
Milling process	Conventional milling		
No. of passes	One cut		

Note CNC-program serves as a programming example and should be tested by simulation before use on component.

CNC-Code

```
; Tool= TM SP 2xD ohne Senkfase 3/8-16 UNC right
; Material= P1
; Vc=3543 Inch/min
; fz=0.002 Inch/tooth
; Conventional milling
; One cut
; Thread Type= Internal Right-Hand Thread
```


Attention, for controls that refer to outer path, values in brackets to be used!

CNC-Code

N10 M6 T1

N20 G90 G54 G00 X0.0000 Y0.0000

N30 Z0.0787 S3747 M3 M8

N40 Z-0.4187

N50 G91

N60 G42 G01 X0.0000 Y0.1505 F2.18 ;(F11.06)

N70 G02 X0.0000 Y-0.3380 I0.0000 J-0.1690 Z-0.0094

N80 G02 X0.0000 Y0.0000 I0.0000 J0.1875 Z-0.0625 F4.37 ;(F22.13)

N90 G02 X0.0000 Y0.3380 I0.0000 J0.1690 Z-0.0094

N100 G40 G01 X0.0000 Y-0.1505

N110 G90

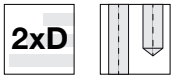
N120 G00 Z0.0787 M9

N130 M30

Attention, for controls that refer to outer path, values in brackets to be used!

Thread milling cutters without chamfer - UNC threads

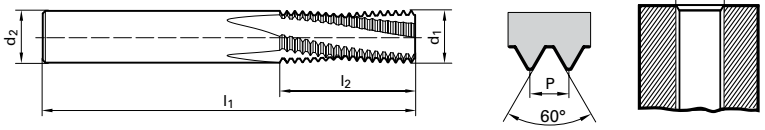
4128



Tool material	Solid Carbide
Coating	TiCN*
Type	TM SP
Shank	HA
Coolant delivery	external

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 inch	d2 inch	l1 inch	l2 inch	No. of flutes	Code no.	EDP Number
10	24	0.136	1/4	2.500	0.437	3	4.826	9041280048260
12	24	0.161	1/4	2.500	0.480	3	5.486	9041280054860
1/4	20	0.185	1/4	2.500	0.575	3	6.350	9041280063500
5/16	18	0.242	1/4	2.500	0.693	3	7.938	9041280079380
3/8	16	0.301	5/16	2.500	0.843	3	9.525	9041280095250
7/16	14	0.354	3/8	3.000	0.965	3	11.113	9041280111130
1/2	13	0.371	3/8	3.000	1.114	3	12.700	9041280127000
9/16	12	0.449	1/2	3.752	1.209	4	14.288	9041280142880
5/8	11	0.496	1/2	3.752	1.409	4	15.875	9041280158750
3/4	10	0.621	5/8	4.252	1.551	4	19.050	9041280190500
7/8	9	0.621	5/8	4.252	1.835	4	22.225	9041280222250
1 “	8	0.621	5/8	4.252	1.937	4	25.400	9041280254000

See page 84 for machining parameters

See page 74 for tap/drill size info

Thread milling cutters without chamfer - UNF threads

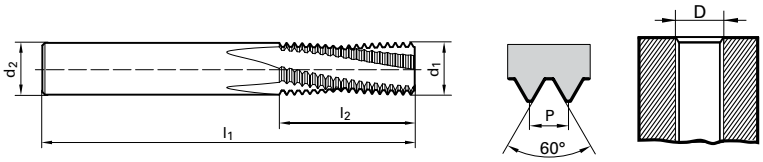
4129

2xD

Tool material	**Solid Carbide**
Coating	TiCN*
Type	TM SP
Shank	HA
Coolant delivery	external

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 inch	d2 inch	l1 inch	l2 inch	No. of flutes	Code no.	EDP Number
10	32	0.150	1/4	2.500	0.453	3	4.826	9041290048260
12	28	0.169	1/4	2.500	0.480	3	5.486	9041290054860
1/4	28	0.203	1/4	2.500	0.555	3	6.350	9041290063500
5/16	24	0.242	1/4	2.500	0.689	3	7.938	9041290079380
3/8	24	0.309	5/16	2.500	0.811	3	9.525	9041290095250
7/16	20	0.371	3/8	3.000	0.976	3	11.113	9041290111130
1/2	20	0.371	3/8	3.000	1.075	3	12.700	9041290127000
9/16	18	0.449	1/2	3.752	1.193	4	14.288	9041290142880
5/8	18	0.496	1/2	3.752	1.307	4	15.875	9041290158750
3/4	16	0.621	5/8	4.252	1.531	4	19.050	9041290190500
7/8	14	0.621	5/8	4.252	1.823	4	22.225	9041290222250
1”	12	0.621	5/8	4.252	1.791	4	25.400	9041290254000

See page 84 for machining parameters

See page 74 for tap/drill size info

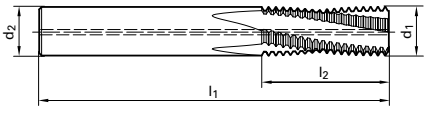
Thread milling cutters - UNC threads

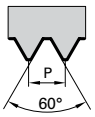
Series	4134	4135
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TM SP	TM SP
Shank	HA	HB
Coolant delivery	axial	axial

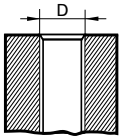
2xD

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary







** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	d1 mm	d2 mm	l1 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
10 - 24	3.40	6.00	54.00	11.10	3	4.826	9041340048260	9041350048260
12 - 24	4.10	6.00	54.00	12.20	3	5.486	9041340054860	9041350054860
1/4 - 20	4.70	6.00	54.00	14.60	3	6.350	9041340063500	9041350063500
5/16 - 18	6.10	8.00	64.00	17.60	3	7.938	9041340079380	9041350079380
3/8 - 16	7.60	8.00	64.00	21.40	3	9.525	9041340095250	9041350095250
7/16 - 14	9.00	10.00	74.00	24.50	3	11.113	9041340111130	9041350111130
1/2 - 13	9.95	10.00	74.00	28.30	4	12.700	9041340127000	9041350127000
9/16 - 12	11.40	12.00	90.00	30.70	4	14.288	9041340142880	9041350142880
5/8 - 11	12.70	14.00	90.00	35.80	4	15.875	9041340158750	9041350158750

See page 84 for machining parameters

See page 74 for tap/drill size info

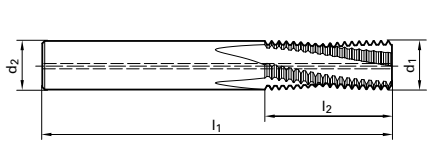
Thread milling cutters - UNF threads

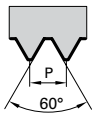
Series	4136	4137
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TM SP	TM SP
Shank	HA	HB
Coolant delivery	axial	axial

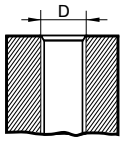
2xD

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary







** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	d1 mm	d2 mm	l1 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
10 - 32	3.80	6.00	54.00	11.10	3	4.826	9041360048260	9041370048260
12 - 28	4.30	6.00	54.00	12.20	3	5.486	9041360054860	9041370054860
1/4 - 28	5.10	6.00	54.00	14.60	3	6.350	9041360063500	9041370063500
5/16 - 24	6.30	8.00	64.00	17.60	3	7.938	9041360079380	9041370079380
3/8 - 24	7.80	8.00	64.00	21.40	3	9.525	9041360095250	9041370095250
7/16 - 20	9.40	10.00	74.00	24.50	3	11.113	9041360111130	9041370111130
1/2 - 20	9.95	10.00	74.00	28.30	4	12.700	9041360127000	9041370127000
9/16 - 18	11.40	12.00	90.00	30.70	4	14.288	9041360142880	9041370142880
5/8 - 18	12.70	14.00	90.00	35.80	4	15.875	9041360158750	9041370158750

See page 84 for machining parameters

See page 74 for tap/drill size info

Thread milling cutters without chamfer - ISO metric threads

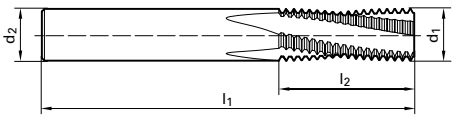
Series	4132	4133
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TM SP	TM SP
Shank	HA	HB
Coolant delivery	external	external

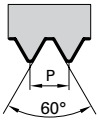
2xD

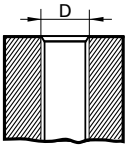
NEW HB Shank

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary







** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	l1 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
M6	1.00	4.80	6.00	54.00	13.50	3	6.000	9041320060000	9041330060000
M8	1.25	6.40	8.00	62.00	18.10	3	8.000	9041320080000	9041330080000
M10	1.50	7.95	10.00	74.00	21.80	3	10.000	9041320100000	9041330100000
M12	1.75	9.95	10.00	74.00	25.40	4	12.000	9041320120000	9041330120000
M14	2.00	11.20	12.00	90.00	31.00	4	14.000	9041320140000	9041330140000
M16	2.00	12.80	14.00	90.00	35.00	4	16.000	9041320160000	9041330160000
M20	2.50	14.95	16.00	102.00	41.30	4	20.000	9041320200000	9041330200000

See page 84 for machining parameters

See page 74 for tap/drill size info

Thread milling cutters without chamfer - ISO metric threads

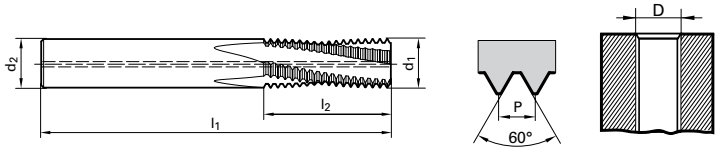
Series	3737	3743
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TM SP	TM SP
Shank	HA	HB
Coolant delivery	axial	axial

2xD

NEW HB Shank

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	l1 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
M6	1.00	4.80	6.00	54.00	13.50	3	6.000	9037370060000	9037430060000
M8	1.25	6.40	8.00	62.00	18.10	3	8.000	9037370080000	9037430080000
M8	1.00	7.95	8.00	62.00	17.50	3	8.005	9037370080050	9037430080050
M10	1.50	7.95	10.00	74.00	21.80	3	10.000	9037370100000	9037430100000
M10	1.00	7.95	10.00	74.00	21.50	3	10.005	9037370100050	9037430100050
M10	1.25	7.95	10.00	74.00	21.90	3	10.006	9037370100060	9037430100060
M12	1.75	9.95	10.00	74.00	25.40	4	12.000	9037370120000	9037430120000
M12	1.50	9.95	10.00	74.00	26.30	4	12.007	9037370120070	9037430120070
M14	2.00	11.20	12.00	90.00	31.00	4	14.000	9037370140000	9037430140000
M14	1.50	11.20	12.00	90.00	30.80	4	14.007	9037370140070	9037430140070
M16	2.00	12.80	14.00	90.00	35.00	4	16.000	9037370160000	9037430160000
M16	1.50	12.80	14.00	90.00	33.80	4	16.007	9037370160070	9037430160070
M20	2.50	14.95	16.00	102.00	41.30	4	20.000	9037370200000	9037430200000
M20	1.50	14.95	16.00	102.00	42.80	4	20.007	9037370200070	9037430200070

See page 84 for machining parameters

See page 74 for tap/drill size info

Thread milling cutters without chamfer - ISO metric threads

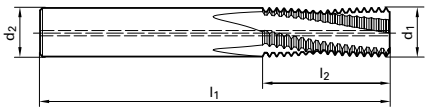
Series	3735	3740
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TM SP	TM SP
Shank	HA	HB
Coolant delivery	axial	axial

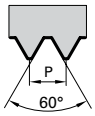
2.5xD

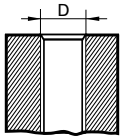
NEW HB Shank

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary







** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	l1 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
M6	1.00	4.80	6.00	54.00	16.50	3	6.000	9037350060000	9037400060000
M8	1.25	6.40	8.00	62.00	21.90	3	8.000	9037350080000	9037400080000
M10	1.50	7.95	10.00	74.00	26.30	3	10.000	9037350100000	9037400100000
M12	1.75	9.95	10.00	74.00	32.40	4	12.000	9037350120000	9037400120000
M14	2.00	11.20	12.00	90.00	37.00	4	14.000	9037350140000	9037400140000
M16	2.00	12.80	14.00	90.00	43.00	4	16.000	9037350160000	9037400160000
M20	2.50	14.95	16.00	102.00	48.80	4	20.000	9037350200000	9037400200000

See page 84 for machining parameters

See page 74 for tap/drill size info


We build tools to your exacting standards.
GUHRING SPECIAL TOOLING
specials@guhring.com

TMC SP – Thread milling cutters with 45° chamfer

GUHRING

CNC Data Sheet

Date 12.11.2019

Machining Task		**Material**
Thread Dimension	5/16-18 UNC right	Corrosion- and acid-resistant steels martensitic
Length	0.50 Inch	
countersink ∢ = 90°	Yes	

Tool		**Cutting Values**			
Description	TMC SP 2xD mit Senkfase	**Milling**			
Milling cutter diameter	d1 = 0.234 Inch	**Vc**	1969 Inch/min	**n**	2675 1/min
Programmed Radius	0.115 Inch	**fz**	0.001 Inch/tooth		
Order-No	3517_7.938	**Vf**	9.00 Inch/min	**Vm**	2.37 Inch/min

NC-Options		**Cycle Time**	
Machine Control	Sinumerik [DIN]	**Total Time**	21.75 sec.
Cutting Path	Center point path, incremental		
Milling process	Conventional milling		
No. of passes	2 passes radial (2/3–1/3)		

Note CNC-program serves as a programming example and should be tested by simulation before use on component.

CNC-Code

- Tool= TMC SP 2xD mit Senkfase 5/16-18 UNC right
- Material= M2
- Vc=1969 Inch/min
- fz=0.001 Inch/tooth
- Conventional milling
- 2 passes radial (2/3–1/3)
- Thread Type= Internal Right-Hand Thread

Attention, for controls that refer to outer path, values in brackets to be used!

CNC-Code

```
N10 M6 T1
N20 G90 G54 G00 X0.0000 Y0.0000
N30 Z0.0787 S1337 M3 M8
N40 Z-0.6929
N50 G01 Z-0.8821 F4.74
N60 G00 Z-0.4278 S2675
N70 G91
N80 G42 G01 X0.0000 Y0.1171 F1.19 ;(F4.74)
N90 G02 X0.0000 Y-0.2641 I0.0000 J-0.1321 Z-0.0083
N100 G02 X0.0000 Y0.0000 I0.0000 J0.1470 Z-0.0556 F2.37 ;(F9.48)
N110 G02 X0.0000 Y0.2641 I0.0000 J0.1321 Z-0.0083
N120 G40 G01 X0.0000 Y-0.1171
N130 G90
N140 G00 Z-0.4278
N150 G91
N160 G42 G01 X0.0000 Y0.1171 F1.19 ;(F4.74)
N170 G02 X0.0000 Y-0.2734 I0.0000 J-0.1367 Z-0.0083
N180 G02 X0.0000 Y0.0000 I0.0000 J0.1563 Z-0.0556 F2.37 ;(F9.48)
N190 G02 X0.0000 Y0.2734 I0.0000 J0.1367 Z-0.0083
N200 G40 G01 X0.0000 Y-0.1171
N210 G90
N220 G00 Z0.0787 M9
N230 M30
```

Attention, for controls that refer to outer path, values in brackets to be used!

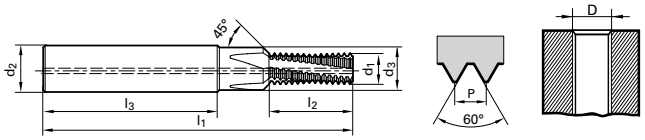
Thread milling cutters with chamfer - UNC threads

Series	3517	3535
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMC SP	TMC SP
Shank	HA	HB
Coolant delivery	axial	axial

2xD

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	No. of flutes	Code no.	EDP Number	EDP Number
1/4	20	4.80	8.00	6.60	62.00	14.60	36.00	3	6.350	9035170063500	9035350063500
5/16	18	5.95	10.00	9.00	74.00	17.60	40.00	3	7.938	9035170079380	9035350079380
3/8	16	7.10	12.00	11.00	80.00	21.40	45.00	4	9.525	9035170095250	9035350095250
7/16	14	7.95	12.00	11.00	80.00	24.50	45.00	4	11.113	9035170111130	9035350111130
1/2	13	9.95	14.00	13.50	90.00	28.30	45.00	4	12.700	9035170127000	9035350127000

See page 84 for machining parameters

See page 74 for tap/drill size info

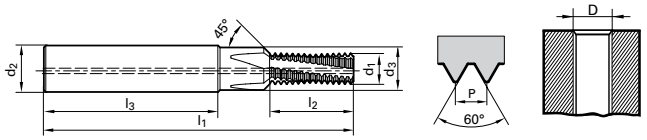
Thread milling cutters with chamfer - UNF threads

Series	3519	3537
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMC SP	TMC SP
Shank	HA	HB
Coolant delivery	axial	axial

2xD

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	No. of flutes	Code no.	EDP Number	EDP Number
1/4	28	4.80	8.00	6.60	62.00	14.10	36.00	3	6.350	9035190063500	9035370063500
5/16	24	5.95	10.00	9.00	74.00	17.50	40.00	3	7.938	9035190079380	9035370079380
3/8	24	7.95	12.00	11.00	80.00	20.60	45.00	4	9.525	9035190095250	9035370095250
7/16	20	7.95	12.00	11.00	80.00	24.80	45.00	4	11.113	9035190111130	9035370111130
1/2	20	9.95	14.00	13.50	90.00	27.30	45.00	4	12.700	9035190127000	9035370127000

See page 84 for machining parameters

See page 74 for tap/drill size info

Thread milling cutters with chamfer - ISO metric threads

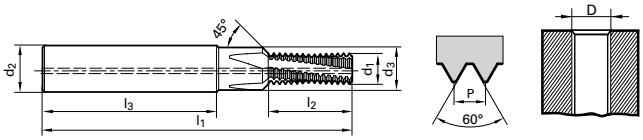
Series	3526	3544
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMC SP	TMC SP
Shank	HA	HB
Coolant delivery	axial	axial

2xD

NEW HB Shank

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	d3 mm	l1 mm	l3 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
‡ M3	0.50	2.30	6.00	3.40	48.00	36.00	6.80	3	3.000	9035260030000	9035440030000
M4	0.70	3.00	6.00	4.50	48.00	36.00	8.80	3	4.000	9035260040000	9035440040000
M5	0.80	4.00	6.00	5.50	54.00	36.00	10.80	3	5.000	9035260050000	9035440050000
M6	1.00	4.80	8.00	6.60	62.00	36.00	13.50	3	6.000	9035260060000	9035440060000
M8	1.25	6.40	10.00	9.00	74.00	40.00	18.10	3	8.000	9035260080000	9035440080000
M10	1.50	7.95	12.00	11.00	80.00	45.00	21.80	4	10.000	9035260100000	9035440100000
M12	1.75	9.95	14.00	13.50	90.00	45.00	25.40	4	12.000	9035260120000	9035440120000
M14	2.00	11.20	16.00	15.50	102.00	48.00	31.00	4	14.000	9035260140000	9035440140000
M16	2.00	12.80	18.00	17.50	102.00	48.00	35.00	4	16.000	9035260160000	9035440160000
M20	2.50	14.50	20.00	21.50	125.00	50.00	41.30	4	20.000	9035260200000	9035440200000

‡ coolant through tools ≥M4 size

See page 84 for machining parameters

See page 74 for tap/drill size info

Thread milling cutters with chamfer - ISO metric fine threads

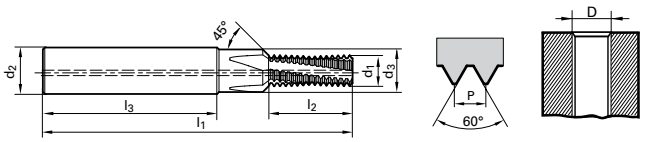
Series	3528	3546
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMC SP	TMC SP
Shank	HA	HB
Coolant delivery	axial	axial

2xD

NEW HB Shank

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	d3 mm	l1 mm	l3 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
M4	0.50	3.00	6.00	4.50	48.00	36.00	8.80	3	4.003	9035280040030	9035460040030
M5	0.50	4.00	6.00	5.50	54.00	36.00	10.80	3	5.003	9035280050030	9035460050030
M6	0.50	4.80	8.00	6.60	62.00	36.00	12.80	3	6.003	9035280060030	9035460060030
M6	0.75	4.80	8.00	6.60	62.00	36.00	13.10	3	6.004	9035280060040	9035460060040
M8	0.75	6.40	10.00	9.00	74.00	40.00	16.90	3	8.004	9035280080040	9035460080040
M8	1.00	6.40	10.00	9.00	74.00	40.00	17.50	3	8.005	9035280080050	9035460080050
M10	1.00	7.95	12.00	11.00	80.00	45.00	21.50	4	10.005	9035280100050	9035460100050
M10	1.25	7.95	12.00	11.00	80.00	45.00	21.90	4	10.006	9035280100060	9035460100060
M12	1.00	9.95	14.00	13.50	90.00	45.00	25.50	4	12.005	9035280120050	9035460120050
M12	1.50	9.95	14.00	13.50	90.00	45.00	26.30	4	12.007	9035280120070	9035460120070
M14	1.50	11.20	16.00	15.50	102.00	48.00	30.80	4	14.007	9035280140070	9035460140070
M16	1.50	12.80	18.00	17.50	102.00	48.00	33.80	4	16.007	9035280160070	9035460160070

See page 84 for machining parameters

See page 74 for tap/drill size info

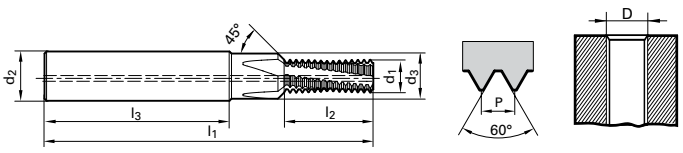
Thread milling cutters with chamfer - ISO metric threads

Series	3759	3760
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMC SP	TMC SP
Shank	HA	HB
Coolant delivery	axial	axial

2.5xD

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	No. of flutes	Code no.	EDP Number	EDP Number
‡ M3	0.50	2.30	6.00	3.40	48.00	7.80	36.00	3	3.000	9037590030000	9037600030000
M4	0.70	3.00	6.00	4.50	48.00	10.90	36.00	3	4.000	9037590040000	9037600040000
M5	0.80	4.00	6.00	5.50	54.00	13.20	36.00	3	5.000	9037590050000	9037600050000
M6	1.00	4.80	8.00	6.60	62.00	16.50	36.00	3	6.000	9037590060000	9037600060000
M8	1.25	6.40	10.00	9.00	74.00	21.90	40.00	3	8.000	9037590080000	9037600080000
M10	1.50	7.95	12.00	11.00	80.00	26.30	45.00	4	10.000	9037590100000	9037600100000
M12	1.75	9.95	14.00	13.50	90.00	32.40	45.00	4	12.000	9037590120000	9037600120000
M14	2.00	11.20	16.00	15.50	102.00	37.00	48.00	4	14.000	9037590140000	9037600140000
M16	2.00	12.80	18.00	17.50	102.00	43.00	48.00	4	16.000	9037590160000	9037600160000
M20	2.50	14.50	20.00	21.50	125.00	48.80	50.00	4	20.000	9037590200000	9037600200000

‡ Axial coolant fed ≥ M4

See page 84 for machining parameters

See page 74 for tap/drill size info

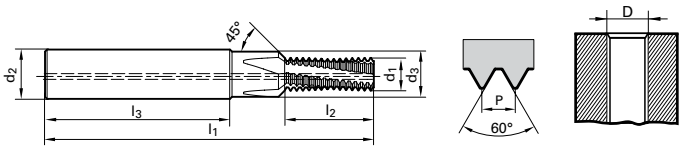
Thread milling cutters with chamfer - ISO metric fine threads

Series	3762	3763
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMC SP	TMC SP
Shank	HA	HB
Coolant delivery	axial	axial

2.5xD

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	No. of flutes	Code no.	EDP Number	EDP Number
M4	0.50	3.00	6.00	4.50	48.00	10.30	36.00	3	4.003	9037620040030	9037630040030
M5	0.50	4.00	6.00	5.50	54.00	12.80	36.00	3	5.003	9037620050030	9037630050030
M6	0.50	4.80	8.00	6.60	62.00	15.30	36.00	3	6.003	9037620060030	9037630060030
M6	0.75	4.80	8.00	6.60	62.00	15.40	36.00	3	6.004	9037620060040	9037630060040
M8	0.75	6.40	10.00	9.00	74.00	20.60	40.00	3	8.004	9037620080040	9037630080040
M8	1.00	6.40	10.00	9.00	74.00	20.50	40.00	3	8.005	9037620080050	9037630080050
M10	1.00	7.95	12.00	11.00	80.00	25.50	45.00	4	10.005	9037620100050	9037630100050
M10	1.25	7.95	12.00	11.00	80.00	25.50	45.00	4	10.006	9037620100060	9037630100060
M12	1.00	9.95	14.00	13.50	90.00	30.50	45.00	4	12.005	9037620120050	9037630120050
M12	1.50	9.95	14.00	13.50	90.00	30.80	45.00	4	12.007	9037620120070	9037630120070
M14	1.50	11.20	16.00	15.50	102.00	38.30	48.00	4	14.007	9037620140070	9037630140070
M16	1.50	12.80	18.00	17.50	102.00	41.30	48.00	4	16.007	9037620160070	9037630160070

See page 84 for machining parameters

See page 74 for tap/drill size info

Thread milling cutters with chamfer - ISO metric threads

Series **4000**

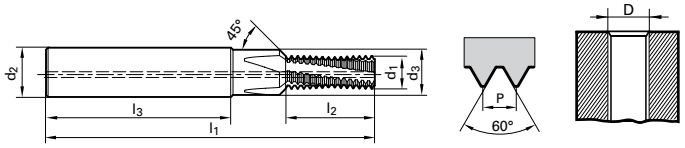
2xD

NEW

Tool material	**Solid Carbide**
Coating	AlCrN
Type	SC-TMC SP
Shank	HB
Coolant delivery	axial

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	○
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary



D	P	d1	d2	d3	l1	l2	No. of flutes	Code no.	EDP Number
Ø	mm	mm	mm	mm	mm	mm			
M3	0.50	2.30	6.00	3.40	48.00	6.80	5	3.000	9040000030000
M4	0.70	3.10	6.00	4.50	48.00	8.80	5	4.000	9040000040000
M4	0.50	3.10	6.00	4.50	48.00	8.80	5	4.003	9040000040030
M5	0.80	4.00	6.00	5.50	54.00	10.80	5	5.000	9040000050000
M5	0.50	4.00	6.00	5.50	54.00	10.80	5	5.003	9040000050030
M6	1.00	4.70	8.00	6.60	62.00	13.50	6	6.000	9040000060000
M6	0.50	4.70	8.00	6.60	62.00	12.80	6	6.003	9040000060030
M6	0.75	4.70	8.00	6.60	62.00	13.10	6	6.004	9040000060040
M8	1.25	6.30	10.00	9.00	74.00	18.10	7	8.000	9040000080000
M8	1.00	6.30	10.00	9.00	74.00	17.50	7	8.005	9040000080050
M10	1.50	7.80	12.00	11.00	80.00	21.80	7	10.000	9040000100000
M10	1.00	7.80	12.00	11.00	80.00	21.50	7	10.005	9040000100050
M10	1.25	7.80	12.00	11.00	80.00	21.90	7	10.006	9040000100060
M12	1.75	9.50	14.00	13.50	90.00	25.40	7	12.000	9040000120000
M12	1.00	9.50	14.00	13.50	90.00	25.50	7	12.005	9040000120050
M12	1.50	9.50	14.00	13.50	90.00	26.30	7	12.007	9040000120070
M14	2.00	10.80	16.00	15.50	102.00	31.00	7	14.000	9040000140000
M14	1.50	10.80	16.00	15.50	102.00	30.80	7	14.007	9040000140070
M16	2.00	12.70	18.00	17.50	102.00	35.00	8	16.000	9040000160000
M16	1.50	12.70	18.00	17.50	102.00	33.80	8	16.007	9040000160070

See page 86 for machining parameters

See page 74 for tap/drill size info

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

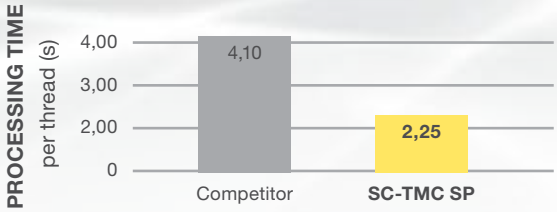
Up to eight cutting edges and optimised geometry: **SC-TMC SP** can almost **halve the machining time**.

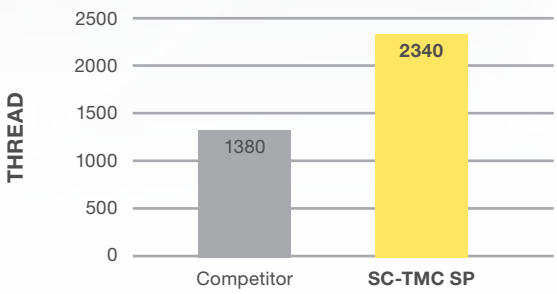
New geometry

Thanks to the new geometry the tool stabilizes 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: vc = 90 m/min, fz = 0.025 mm [conventional milling]

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

GUHRING

CNC Data Sheet

Date 12.11.2019

Machining Task		**Material**
Thread Dimension	1 1/4-12UNFx2.117 right	Cast aluminum alloys
Length	1.30 Inch	
countersink ∢ = 90°	No	

Tool		**Cutting Values**			
Description	TMU Universalgewindefräser	**Milling**			
Milling cutter diameter	d1 = 0.785 Inch	**Vc**	9055 Inch/min	**n**	3670 1/min
Programmed Radius	0.391 Inch	**fz**	0.005 Inch/tooth		
Order-No	3596_20.120	**Vf**	87.00 Inch/min	**Vm**	32.22 Inch/min

NC-Options		**Cycle Time**	
Machine Control	Sinumerik [DIN]	**Total Time**	4.76 sec.
Cutting Path	Center point path, incremental		
Milling process	Conventional milling		
No. of passes	One cut		

Note CNC-program serves as a programming example and should be tested by simulation before use on component.

CNC-Code

- Tool= TMU Universalgewindefräser 1 1/4-12UNFx2.117 right
- Material= N2
- Vc=9055 Inch/min
- fz=0.005 Inch/tooth
- Conventional milling
- One cut
- Thread Type= Internal Right-Hand Thread

Attention, for controls that refer to outer path, values in brackets to be used!

CNC-Code

N10 M6 T1
N20 G90 G54 G00 X0.0000 Y0.0000
N30 Z0.0787 S3670 M3 M8
N40 Z-1.1909
N50 G91
N60 G42 G01 X0.0000 Y0.3927 F16.11 ;(F43.34)
N70 G02 X0.0000 Y-1.0177 I0.0000 J-0.5089 Z-0.0125
N80 G02 X0.0000 Y0.0000 I0.0000 J0.6250 Z-0.0833 F32.22 ;(F86.69)
N90 G02 X0.0000 Y1.0177 I0.0000 J0.5089 Z-0.0125
N100 G40 G01 X0.0000 Y-0.3927
N110 G90
N120 G00 Z0.0787 M9
N130 M30

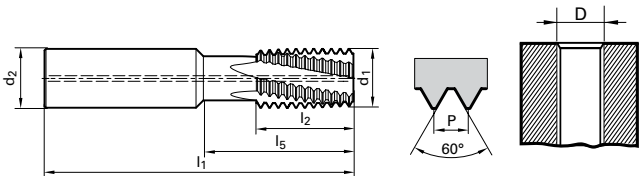
Attention, for controls that refer to outer path, values in brackets to be used!

Universal thread milling cutters - UN threads

Series	3595	3596
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMU SP	TMU SP
Shank	HA	HB
Coolant delivery	axial	axial

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

TPI	D Ø	d1 mm	d2 mm	l1 mm	l5 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
24	≥ 1/2	9.95	10.00	70.00	25.00	16.00	4	10.240	9035950102400	9035960102400
16	≥ 5/8	11.95	12.00	80.00	31.00	20.00	4	12.160	9035950121600	9035960121600
18	≥ 5/8	11.95	12.00	80.00	31.00	20.00	4	12.180	9035950121800	9035960121800
20	≥ 11/16	11.95	12.00	80.00	31.00	20.00	4	12.200	9035950122000	9035960122000
24	≥ 5/8	11.95	12.00	80.00	31.00	20.00	5	12.240	9035950122400	9035960122400
14	≥ 7/8	15.95	16.00	90.00	40.00	25.00	5	16.140	9035950161400	9035960161400
16	≥ 7/8	15.95	16.00	90.00	40.00	25.00	5	16.160	9035950161600	9035960161600
18	≥ 7/8	15.95	16.00	90.00	40.00	25.00	5	16.180	9035950161800	9035960161800
20	≥ 13/16	19.95	16.00	90.00	40.00	25.00	5	16.200	9035950162000	9035960162000
8	≥ 1	19.95	20.00	105.00	50.00	33.00	5	20.080	9035950200800	9035960200800
12	≥ 1	19.95	20.00	105.00	50.00	33.00	5	20.120	9035950201200	9035960201200
14	≥ 1	19.95	20.00	105.00	50.00	33.00	5	20.140	9035950201400	9035960201400
16	≥ 1	19.95	20.00	105.00	50.00	33.00	5	20.160	9035950201600	9035960201600

See page 84 for machining parameters

See page 74 for tap/drill size info

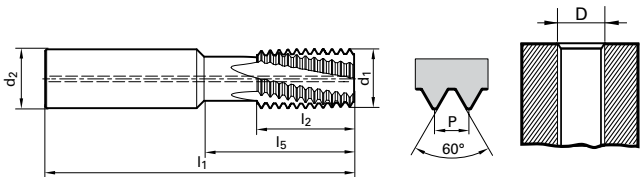
Universal thread milling cutters - ISO metric threads

Series	3541	3556
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMU SP	TMU SP
Shank	HA	HB
Coolant delivery	axial	axial

NEW HB Shank

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

P mm	D Ø mm	d1 mm	d2 mm	l1 mm	l5 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
1.00	≥ 12	9.95	10.00	70.00	25.00	16.00	4	10.100	9035410101000	9035560101000
1.25	≥ 14	9.95	10.00	70.00	25.00	16.00	4	10.125	9035410101250	9035560101250
1.50	≥ 14	9.95	10.00	70.00	25.00	16.00	4	10.150	9035410101500	9035560101500
1.00	≥ 16	11.95	12.00	80.00	31.00	20.00	4	12.100	9035410121000	9035560121000
1.25	≥ 16	11.95	12.00	80.00	31.00	20.00	4	12.125	9035410121250	9035560121250
1.50	≥ 16	11.95	12.00	80.00	31.00	20.00	4	12.150	9035410121500	9035560121500
1.00	≥ 18	15.95	16.00	90.00	40.00	25.00	5	16.100	9035410161000	9035560161000
1.50	≥ 20	15.95	16.00	90.00	40.00	25.00	5	16.150	9035410161500	9035560161500
2.00	≥ 22	15.95	16.00	90.00	40.00	25.00	5	16.200	9035410162000	9035560162000
3.00	≥ 24	19.95	18.00	102.00	50.00	33.00	5	18.300	9035410183000	9035560183000
1.00	≥ 24	19.95	20.00	105.00	50.00	33.00	5	20.100	9035410201000	9035560201000
1.50	≥ 26	19.95	20.00	105.00	50.00	33.00	5	20.150	9035410201500	9035560201500
2.00	≥ 26	19.95	20.00	105.00	50.00	33.00	5	20.200	9035410202000	9035560202000
2.50	≥ 26	19.95	20.00	105.00	50.00	33.00	5	20.250	9035410202500	9035560202500
3.00	≥ 27	19.95	20.00	105.00	50.00	33.00	5	20.300	9035410203000	9035560203000
3.50	≥ 30	19.95	20.00	105.00	50.00	33.00	5	20.350	9035410203500	9035560203500

See page 84 for machining parameters

See page 74 for tap/drill size info

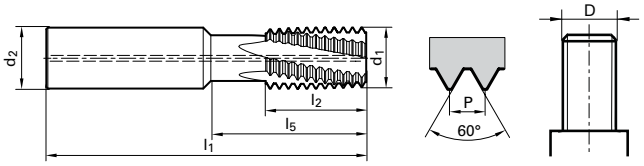
External thread milling cutters - metric/metric fine threads

Series	4162	4163
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMU SP	TMU SP
Shank	HA	HB
Coolant delivery	axial	axial

NEW

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

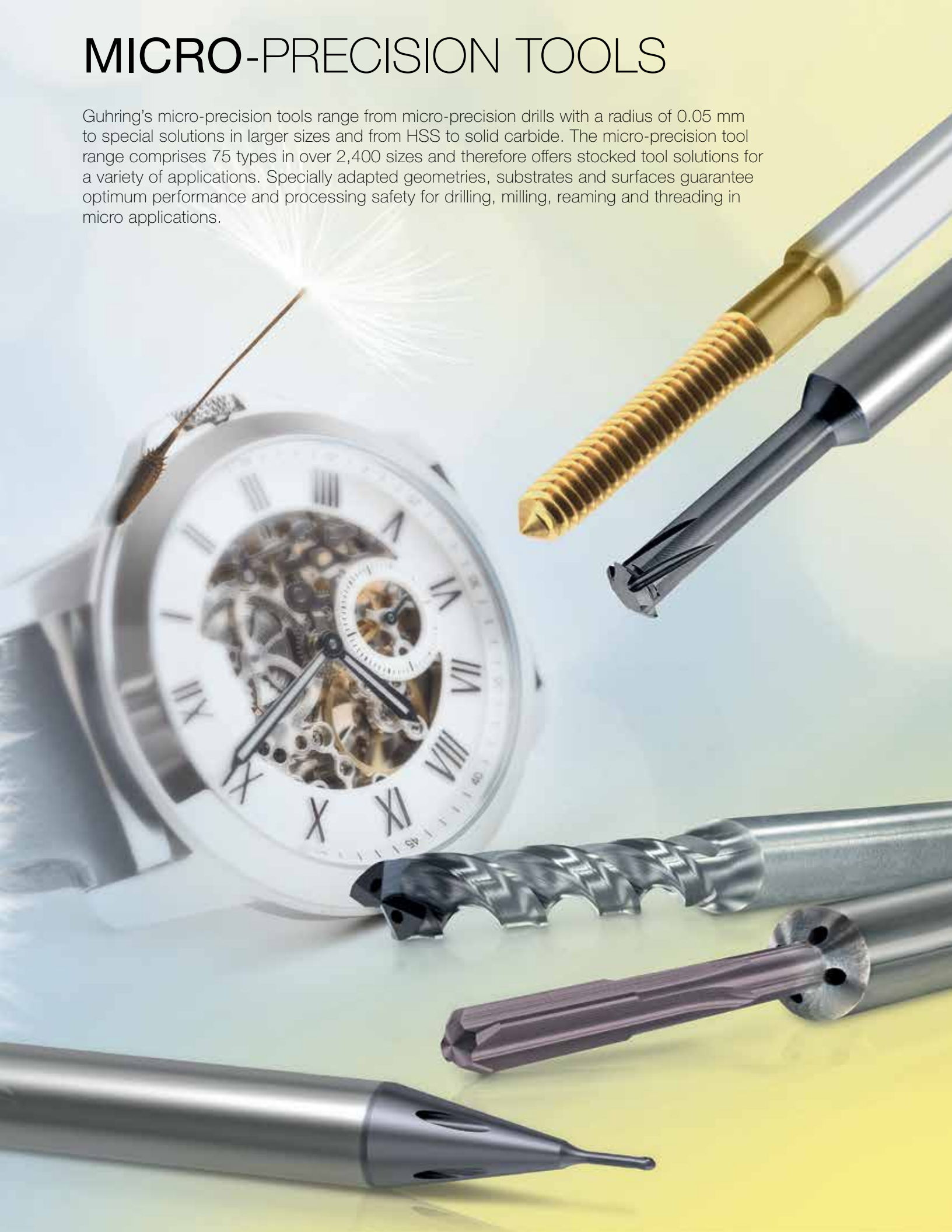
P	D	d1	d2	l1	l5	l2	No. of flutes	Code no.	EDP Number	EDP Number
mm	Ø mm	mm	mm	mm	mm	mm				
0.50	≥ 3	9.95	10.00	70.00	25.00	16.00	4	10.050	9041620100500	9041630100500
0.75	≥ 5	9.95	10.00	70.00	25.00	16.00	4	10.075	9041620100750	9041630100750
1.00	≥ 6	11.95	12.00	80.00	31.00	20.00	4	12.100	9041620121000	9041630121000
1.25	≥ 8	11.95	12.00	80.00	31.00	20.00	4	12.125	9041620121250	9041630121250
1.50	≥ 10	11.95	12.00	80.00	31.00	20.00	4	12.150	9041620121500	9041630121500
1.50	≥ 10	15.95	16.00	90.00	40.00	25.00	5	16.150	9041620161500	9041630161500
2.00	≥ 14	15.95	16.00	90.00	40.00	25.00	5	16.200	9041620162000	9041630162000
2.50	≥ 18	15.95	16.00	90.00	40.00	25.00	5	16.250	9041620162500	9041630162500
3.00	≥ 24	19.95	20.00	105.00	50.00	33.00	5	20.300	9041620203000	9041630203000

See page 84 for machining parameters

See page 74 for tap/drill size info

MICRO-PRECISION TOOLS

Guhring's micro-precision tools range from micro-precision drills with a radius of 0.05 mm to special solutions in larger sizes and from HSS to solid carbide. The micro-precision tool range comprises 75 types in over 2,400 sizes and therefore offers stocked tool solutions for a variety of applications. Specially adapted geometries, substrates and surfaces guarantee optimum performance and processing safety for drilling, milling, reaming and threading in micro applications.



GUHRING

CNC Data Sheet

Date 12.11.2019

Machining Task		Material	
Thread Dimension	1/2-20 UNF right	Cast iron	
Length	0.23 Inch		
countersink ∢ = 90°	Yes		

Tool		Cutting Values			
Description	DTMC SP 2xD	**Milling**			
Milling cutter diameter	d1 = 0.402 Inch	**Vc**	4331 Inch/min	**n**	3433 1/min
Programmed Radius	0.199 Inch	**fz**	0.002 Inch/tooth		
Order-No	4141_12.700	**Vf**	16.22 Inch/min	**Vm**	3.19 Inch/min
		Drilling			
		Vc	4331 Inch/min	**n**	3433 1/min
		fb	0.006 Inch/U	**Vb**	20.27 Inch/min

NC-Options		Cycle Time	
Machine Control	Sinumerik [DIN]	**Total Time**	13.79 sec.
Cutting Path	Center point path, incremental		
Milling process	Conventional milling		
No. of passes	One cut		
Pecking	1 pass		

Note CNC-program serves as a programming example and should be tested by simulation before use on component.

CNC-Code

- Tool= DTMC SP 2xD 1/2-20 UNF right
- Material= K1
- Vc=4331 Inch/min

Attention, for controls that refer to outer path, values in brackets to be used!

CNC-Code

- fb=0.006 Inch/U
- fz=0.002 Inch/tooth
- No. of peck= 1 pass
- Conventional milling
- One cut
- Thread Type= Internal Right-Hand Thread

N10 M6 T1

N20 G90 G54 G00 X0.0000 Y0.0000

N30 G00 Z0.0787 S3433 M3 M8

N40 G01 Z-0.0394 F10.14

N50 G01 Z-0.7163 F20.27

N60 G00 Z0.0787

N70 G00 Z-0.6769

N80 G01 Z-1.2819 F20.27

N90 G00 Z0.0787 S3433

N100 G00 Z-0.2399

N110 G91

N120 G42 G01 X0.0000 Y0.2008 F1.60 ;(F8.11)

N130 G02 X0.0000 Y-0.4508 I0.0000 J-0.2254 Z-0.0075

N140 G02 X0.0000 Y0.0000 I0.0000 J0.2500 Z-0.0500 F3.19 ;(F16.22)

N150 G02 X0.0000 Y0.4508 I0.0000 J0.2254 Z-0.0075

N160 G40 G01 X0.0000 Y-0.2008

N170 G90

N180 G00 Z0.0787 M9

N190 M30

Attention, for controls that refer to outer path, values in brackets to be used!

Drill/thread milling cutters - UNC threads

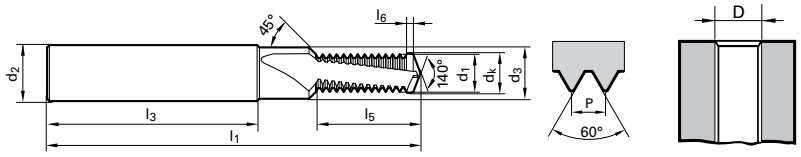
2xD

NEW

Series	4138	4139
Tool material	Solid Carbide	
Coating	Uncoated	TiCN*
Type	DTMC SP	DTMC SP
Shank	HA	HA
Coolant delivery	external	axial

Material		Suitability
P	Steel	
M	Stainless steel	
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	
H	Hardened steel	

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	d3 mm	l1 mm	l3 mm	l6 mm	l5 mm	No. of flutes	Code no.	EDP Number	EDP Number
1/4	20	5.00	8.00	6.60	62.00	36.00	1.30	14.90	2	6.350	9041380063500	9041390063500
5/16	18	6.25	10.00	9.00	74.00	40.00	1.50	18.10	2	7.938	9041380079380	9041390079380
3/8	16	7.50	12.00	11.00	80.00	45.00	1.50	22.10	2	9.525	9041380095250	9041390095250
7/16	14	8.80	12.00	11.00	80.00	45.00	1.50	25.00	2	11.113	9041380111130	9041390111130
1/2	13	10.20	14.00	13.50	90.00	45.00	1.50	26.90	2	12.700	9041380127000	9041390127000
9/16	12	11.60	16.00	15.50	102.00	48.00	1.50	31.20	2	14.288	9041380142880	9041390142880
5/8	11	13.00	18.00	17.50	102.00	48.00	1.50	36.30	2	15.875	9041380158750	9041390158750

See page 88 for machining parameters

Drill/thread milling cutters - UNF threads

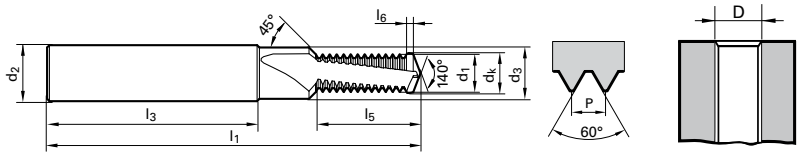
2xD

NEW

Series	4140	4141
Tool material	Solid Carbide	
Coating	Uncoated	TiCN*
Type	DTMC SP	DTMC SP
Shank	HA	HA
Coolant delivery	external	axial

Material		Suitability
P	Steel	
M	Stainless steel	
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	
H	Hardened steel	

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	d3 mm	l1 mm	l3 mm	l6 mm	l5 mm	No. of flutes	Code no.	EDP Number	EDP Number
1/4	28	5.00	8.00	6.60	62.00	36.00	1.00	12.80	2	6.350	9041400063500	9041410063500
5/16	24	6.25	10.00	9.00	74.00	40.00	1.10	18.20	2	7.938	9041400079380	9041410079380
3/8	24	7.95	12.00	11.00	80.00	45.00	1.10	20.60	2	9.525	9041400095250	9041410095250
7/16	20	9.50	12.00	11.00	80.00	45.00	1.30	24.70	2	11.113	9041400111130	9041410111130
1/2	20	10.20	14.00	13.50	90.00	45.00	1.30	27.50	2	12.700	9041400127000	9041410127000
9/16	18	11.60	16.00	15.50	102.00	48.00	1.50	30.60	2	14.288	9041400142880	9041410142880
5/8	18	13.00	18.00	17.50	102.00	48.00	1.50	33.70	2	15.875	9041400158750	9041410158750

See page 88 for machining parameters

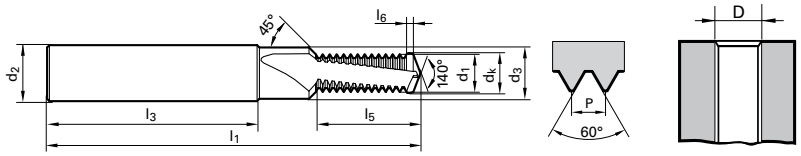
Drill/thread milling cutters - ISO metric threads

Series	3778	3780
Tool material	Solid Carbide	
Coating	Uncoated	TiCN*
Type	DTMC SP	DTMC SP
Shank	HA	HA
Coolant delivery	external	external

2xD

Material		Suitability
P	Steel	
M	Stainless steel	
K	Cast iron	○
N	Aluminum	●
S	Ni / Ti alloys	
H	Hardened steel	

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	d3 mm	l1 mm	l3 mm	l6 mm	l5 mm	No. of flutes	Code no.	EDP Number	EDP Number
M3	0.50	2.40	6.00	3.40	48.00	36.00	0.50	7.00	2	3.000	9037780030000	9037800030000
M4	0.70	3.20	6.00	4.50	48.00	36.00	0.70	9.00	2	4.000	9037780040000	9037800040000
M5	0.80	4.00	6.00	5.50	54.00	36.00	0.80	11.20	2	5.000	9037780050000	9037800050000
M6	1.00	4.75	8.00	6.60	62.00	36.00	1.00	13.90	2	6.000	9037780060000	9037800060000
M8	1.25	6.35	10.00	9.00	74.00	40.00	1.25	18.47	2	8.000	9037780080000	9037800080000
M10	1.50	7.95	12.00	11.00	80.00	45.00	1.50	22.50	2	10.000	9037780100000	9037800100000
M12	1.75	9.95	14.00	13.20	90.00	45.00	1.50	26.10	2	12.000	9037780120000	9037800120000
M14	2.00	11.20	16.00	15.50	102.00	48.00	1.50	31.70	2	14.000	9037780140000	9037800140000
M16	2.00	13.20	18.00	17.50	102.00	48.00	1.50	36.00	2	16.000	9037780160000	9037800160000

See page 88 for machining parameters

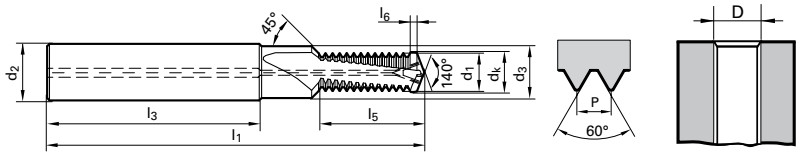
Drill/thread milling cutters - ISO metric threads

Series	3779	3781
Tool material	Solid Carbide	
Coating	Uncoated	TiCN*
Type	DTMC SP	DTMC SP
Shank	HA	HA
Coolant delivery	axial	axial

2xD

Material		Suitability
P	Steel	
M	Stainless steel	
K	Cast iron	○
N	Aluminum	●
S	Ni / Ti alloys	
H	Hardened steel	

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	d3 mm	l1 mm	l3 mm	l6 mm	l5 mm	No. of flutes	Code no.	EDP Number	EDP Number
M4	0.70	3.20	6.00	4.50	48.00	36.00	0.70	9.00	2	4.000	9037790040000	9037810040000
M5	0.80	4.00	6.00	5.50	54.00	36.00	0.80	11.20	2	5.000	9037790050000	9037810050000
M6	1.00	4.75	8.00	6.60	62.00	36.00	1.00	13.90	2	6.000	9037790060000	9037810060000
M8	1.25	6.35	10.00	9.00	74.00	40.00	1.25	18.47	2	8.000	9037790080000	9037810080000
M10	1.50	7.95	12.00	11.00	80.00	45.00	1.50	22.50	2	10.000	9037790100000	9037810100000
M12	1.75	9.95	14.00	13.20	90.00	45.00	1.50	26.10	2	12.000	9037790120000	9037810120000
M14	2.00	11.20	16.00	15.50	102.00	48.00	1.50	31.70	2	14.000	9037790140000	9037810140000
M16	2.00	13.20	18.00	17.50	102.00	48.00	1.50	36.00	2	16.000	9037790160000	9037810160000

See page 88 for machining parameters

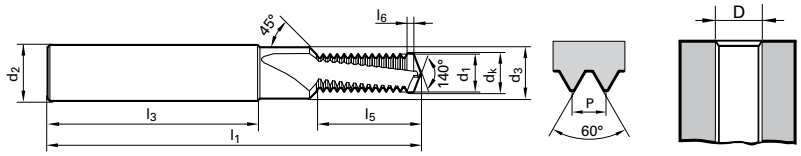
Drill/thread milling cutters - ISO metric threads

Series	3790	3792
Tool material	Solid Carbide	
Coating	Uncoated	TiCN*
Type	DTMC SP	DTMC SP
Shank	HA	HA
Coolant delivery	external	external

2xD

Material		Suitability
P	Steel	
M	Stainless steel	
K	Cast iron	○
N	Aluminum	●
S	Ni / Ti alloys	
H	Hardened steel	

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	d3 mm	l1 mm	l3 mm	l6 mm	l5 mm	No. flutes	Code no.	EDP Number	EDP Number
M4	0.50	3.20	6.00	4.50	48.00	36.00	0.50	8.60	2	4.003	9037900040030	9037920040030
M5	0.50	4.00	6.00	5.50	54.00	36.00	0.50	10.80	2	5.003	9037900050030	9037920050030
M6	0.75	4.75	8.00	6.60	62.00	36.00	0.75	12.90	2	6.004	9037900060040	9037920060040
M8	0.75	6.35	10.00	9.00	74.00	40.00	0.75	17.10	2	8.004	9037900080040	9037920080040
M8	1.00	6.35	10.00	9.00	74.00	40.00	1.00	17.30	2	8.005	9037900080050	9037920080050
M10	1.00	7.95	12.00	11.00	80.00	45.00	1.00	21.60	2	10.005	9037900100050	9037920100050
M10	1.25	7.95	12.00	11.00	80.00	45.00	1.25	21.60	2	10.006	9037900100060	9037920100060
M12	1.00	9.95	14.00	13.50	90.00	45.00	1.00	26.00	2	12.005	9037900120050	9037920120050
M12	1.50	9.95	14.00	13.50	90.00	45.00	1.50	27.40	2	12.007	9037900120070	9037920120070
M14	1.50	11.20	16.00	15.50	102.00	48.00	1.50	30.80	2	14.007	9037900140070	9037920140070
M16	1.50	13.20	18.00	17.50	102.00	48.00	1.50	34.10	2	16.007	9037900160070	9037920160070

See page 88 for machining parameters

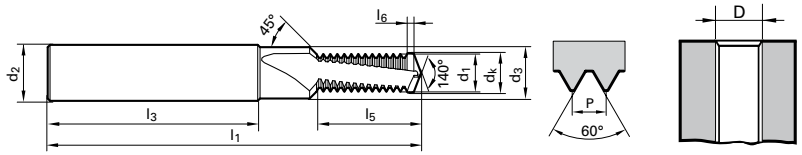
Drill/thread milling cutters - ISO metric threads

Series	3791	3793
Tool material	Solid Carbide	
Coating	Uncoated	TiCN*
Type	DTMC SP	DTMC SP
Shank	HA	HA
Coolant delivery	axial	axial

2xD

Material		Suitability
P	Steel	
M	Stainless steel	
K	Cast iron	○
N	Aluminum	●
S	Ni / Ti alloys	
H	Hardened steel	

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	d3 mm	l1 mm	l3 mm	l6 mm	l5 mm	No. flutes	Code no.	EDP Number	EDP Number
M4	0.50	3.20	6.00	4.50	48.00	36.00	0.50	8.60	2	4.003	**9037910040030**	**9037930040030**
M5	0.50	4.00	6.00	5.50	54.00	36.00	0.50	10.80	2	5.003	**9037910050030**	**9037930050030**
M6	0.75	4.75	8.00	6.60	62.00	36.00	0.75	12.90	2	6.004	**9037910060040**	**9037930060040**
M8	0.75	6.35	10.00	9.00	74.00	40.00	0.75	17.10	2	8.004	**9037910080040**	**9037930080040**
M8	1.00	6.35	10.00	9.00	74.00	40.00	1.00	17.30	2	8.005	**9037910080050**	**9037930080050**
M10	1.00	7.95	12.00	11.00	80.00	45.00	1.00	21.60	2	10.005	**9037910100050**	**9037930100050**
M10	1.25	7.95	12.00	11.00	80.00	45.00	1.25	21.60	2	10.006	**9037910100060**	**9037930100060**
M12	1.00	9.95	14.00	13.50	90.00	45.00	1.00	26.00	2	12.005	**9037910120050**	**9037930120050**
M12	1.50	9.95	14.00	13.50	90.00	45.00	1.50	27.40	2	12.007	**9037910120070**	**9037930120070**
M14	1.50	11.20	16.00	15.50	102.00	48.00	1.50	30.80	2	14.007	**9037910140070**	**9037930140070**
M16	1.50	13.20	18.00	17.50	102.00	48.00	1.50	34.10	2	16.007	**9037910160070**	**9037930160070**

See page 88 for machining parameters

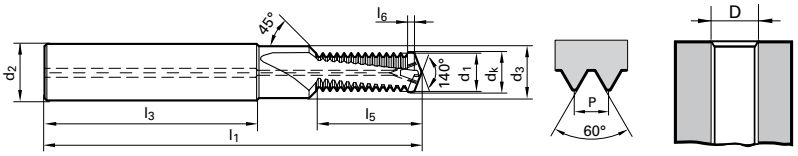
Drill/thread milling cutters - ISO metric threads

Series	3783	3785
Tool material	Solid Carbide	
Coating	Uncoated	TiCN*
Type	DTMC SP	DTMC SP
Shank	HA	HA
Coolant delivery	axial	axial

2.5xD

Material		Suitability
P	Steel	
M	Stainless steel	
K	Cast iron	○
N	Aluminum	●
S	Ni / Ti alloys	
H	Hardened steel	

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	P mm	d1 mm	d2 mm	d3 mm	l1 mm	l3 mm	l6 mm	l5 mm	No. of flutes	Code no.	EDP Number	EDP Number
M4	0.70	3.20	6.00	4.50	48.00	36.00	0.70	11.10	2	4.000	9037830040000	9037850040000
M5	0.80	4.60	6.00	5.50	54.00	36.00	0.80	13.60	2	5.000	9037830050000	9037850050000
M6	1.00	4.75	8.00	6.60	62.00	36.00	1.00	16.90	2	6.000	9037830060000	9037850060000
M8	1.25	6.35	10.00	9.00	74.00	40.00	1.25	22.50	2	8.000	9037830080000	9037850080000
M10	1.50	7.95	12.00	11.00	80.00	45.00	1.50	27.00	2	10.000	9037830100000	9037850100000
M12	1.75	9.95	14.00	13.20	90.00	45.00	1.50	31.40	2	12.000	9037830120000	9037850120000
M14	2.00	11.20	16.00	15.50	102.00	48.00	1.50	39.70	2	14.000	9037830140000	9037850140000
M16	2.00	13.20	18.00	17.50	102.00	48.00	1.50	46.00	2	16.000	9037830160000	9037850160000

See page 88 for machining parameters

Pipe thread milling cutters

Thread milling cutters without chamfer - NPT threads

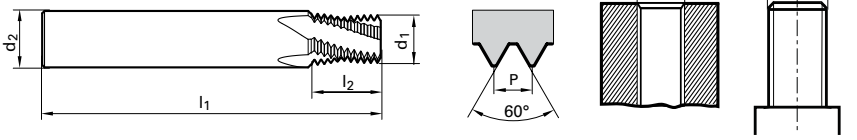
Series **4130**

Tool material	**Solid Carbide**
Coating	TiCN*
Type	TM SP
Shank	HA
Coolant delivery	external

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary

For internal and external threading



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 inch	d2 inch	l1 inch	l2 inch	No. of flutes	Code no.	EDP Number
1/16	27	0.213	5/16	2.250	0.390	3	8.190	9041300081900
1/8	27	0.288	5/16	2.250	0.390	3	10.620	9041300106200
1/4	18	0.391	1/2	3.250	0.583	4	14.140	9041300141400
3/8	18	0.441	1/2	3.250	0.583	4	17.570	9041300175700
1/2	14	0.571	5/8	3.500	0.748	4	21.900	9041300219000
1	11-½	0.689	3/4	3.750	0.913	5	34.180	9041300341800

See page 84 for machining parameters

See page 74 for tap/drill size info

Thread milling cutters without chamfer - NPTF threads

Series **4131**

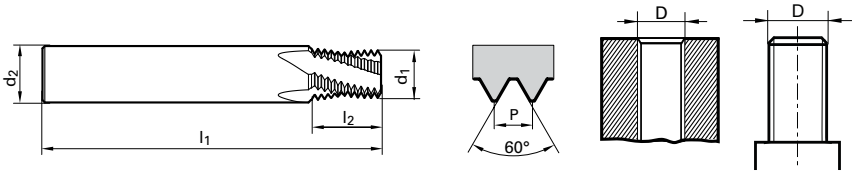
NEW

Tool material	**Solid Carbide**
Coating	TiCN*
Type	TM SP
Shank	HA
Coolant delivery	external

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary

For internal and external threading



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 inch	d2 inch	l1 inch	l2 inch	No. of flutes	Code no.	EDP Number
1/16	27	0.213	5/16	2.250	0.390	3	8.190	9041310081900
1/8	27	0.288	5/16	2.250	0.390	3	10.620	9041310106200
1/4	18	0.391	1/2	3.250	0.583	4	14.140	9041310141400
3/8	18	0.441	1/2	3.250	0.583	4	17.570	9041310175700
1/2	14	0.571	5/8	3.500	0.748	4	21.900	9041310219000
1-11	11-½	0.689	3/4	3.750	0.913	5	34.180	9041310341800

See page 84 for machining parameters

See page 74 for tap/drill size info

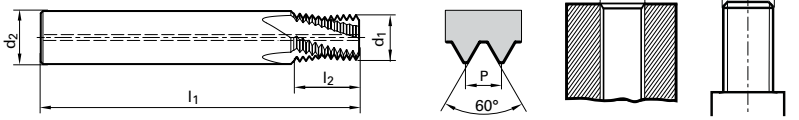
Thread milling cutters without chamfer - NPT threads

	Series	3753	3754
	Tool material	Solid Carbide	
	Coating	TiCN*	TiCN*
	Type	TM SP	TM SP
	Shank	HA	HB
	Coolant delivery	axial	axial

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary

For internal and external threading



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
1/16	27	5.90	8.00	54.00	9.90	3	8.190	9037530081900	9037540081900
1/8	27	7.30	8.00	64.00	9.90	3	10.620	9037530106200	9037540106200
1/4	18	9.95	12.00	72.00	19.05	4	14.140	9037530141400	9037540141400
3/8	18	12.20	14.00	80.00	14.82	4	17.570	9037530175700	9037540175700

See page 84 for machining parameters

See page 74 for tap/drill size info

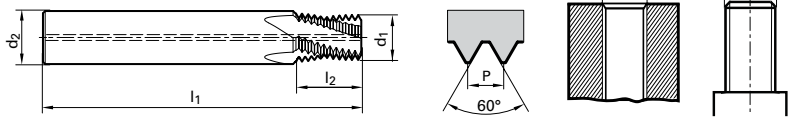
Thread milling cutters without chamfer - NPTF threads

Series	3756	3757
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TM SP	TM SP
Shank	HA	HB
Coolant delivery	axial	axial

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary

For internal and external threading



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
1/16	27	5.90	8.00	54.00	9.90	3	8.190	**9037560081900**	**9037570081900**
1/8	27	7.30	8.00	64.00	9.90	3	10.620	**9037560106200**	**9037570106200**
1/4	18	9.95	12.00	72.00	19.05	4	14.140	**9037560141400**	**9037570141400**
3/8	18	12.20	14.00	80.00	14.82	4	17.570	**9037560175700**	**9037570175700**

See page 84 for machining parameters

See page 74 for tap/drill size info

Universal thread milling cutters - NPT threads

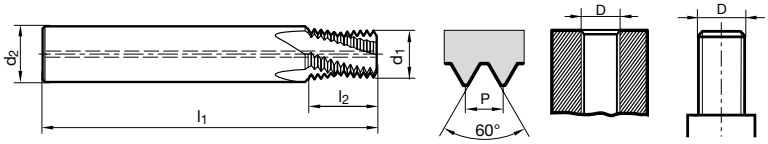
Series	3768	3769
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMU SP	TMU SP
Shank	HA	HB
Coolant delivery	axial	axial

NEW

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary

For internal and external threading



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
≥ 1/2	14	14.50	16.00	90.00	19.05	5	21.900	9037680219000	9037690219000
≥ 1	11-½	18.50	20.00	90.00	23.19	5	34.180	9037680341800	9037690341800

See page 84 for machining parameters

See page 74 for tap/drill size info

Universal thread milling cutters - NPTF threads

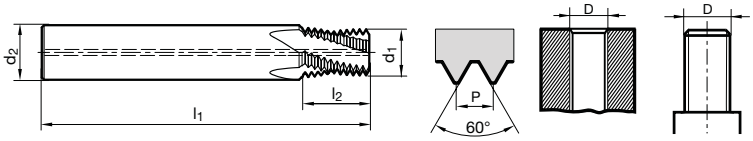
NEW

Series	3772	3773
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMU SP	TMU SP
Shank	HA	HB
Coolant delivery	axial	axial

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary

For internal and external threading



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

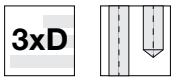
D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
≥ 1/2	14	14.50	16.00	90.00	19.05	5	21.900	9037720219000	9037730219000
≥ 1	11-½	18.50	20.00	90.00	23.19	5	34.180	9037720341800	9037730341800

See page 84 for machining parameters

See page 74 for tap/drill size info

Micro-thread milling cutters - G (BSPP) threads

Series **4228**



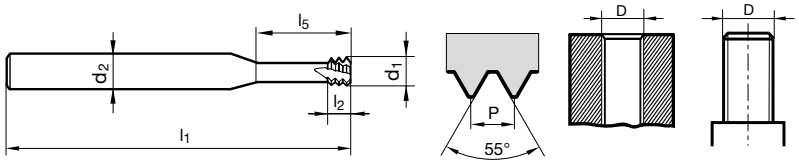
NEW

Tool material	**Solid Carbide**
Coating	TiCN*
Type	MTM3 SP
Shank	HA
Coolant delivery	external

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	●

●=Optimal ○=Secondary

For internal and external threading



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	l5 mm	No. of flutes	Code no.	EDP Number
G1/16 - G1/8	28	6.20	8.00	64.00	2.70	19.50	4	9.728	9042280097280
G1/4 - G3/8	19	9.95	10.00	73.00	4.00	25.00	4	16.662	9042280166620
G1/2 - G7/8	14	11.95	12.00	84.00	5.40	37.00	4	30.201	9042280302010
G1 - G2	11	15.95	16.00	105.00	6.90	44.00	5	59.614	9042280596140

See page 84 for machining parameters

See page 74 for tap/drill size info

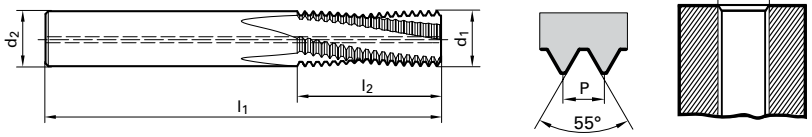
Thread milling cutters without chamfer - G (BSPP) threads

Series	3745	3748
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TM SP	TM SP
Shank	HA	HB
Coolant delivery	axial	axial

NEW HB Shank

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
G1/8	28	7.95	8.00	64.00	21.30	3	9.728	9037450097280	9037480097280
G1/4	19	10.50	12.00	90.00	28.70	4	13.157	9037450131570	9037480131570
G3/8	19	13.60	14.00	90.00	35.40	4	16.662	9037450166620	9037480166620

See page 84 for machining parameters

See page 74 for tap/drill size info

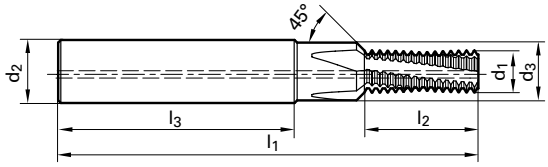
Thread milling cutters with chamfer - G (BSPP) threads

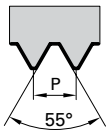
Series	3515	3533
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMC SP	TMC SP
Shank	HA	HB
Coolant delivery	axial	axial

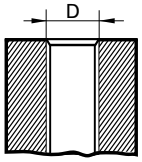
NEW

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary







** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

D Ø	TPI	d1 mm	d2 mm	d3 mm	l1 mm	l3 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
G1/8	28	7.95	12.00	11.00	80.00	45.00	21.30	4	9.728	9035150097280	9035330097280
G1/4	19	9.95	14.00	13.90	90.00	45.00	28.70	4	13.157	9035150131570	9035330131570
G3/8	19	13.60	18.00	17.50	102.00	48.00	35.40	4	16.662	9035150166620	9035330166620

See page 84 for machining parameters

See page 74 for tap/drill size info

Universal thread milling cutters - G (BSPP) threads

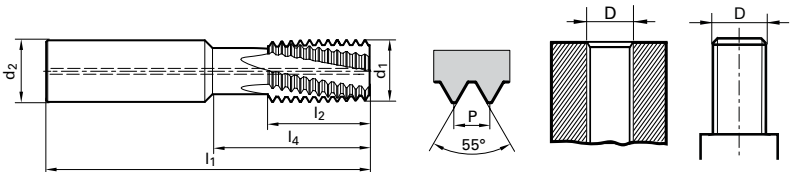
NEW

Series	3542	3557
Tool material	Solid Carbide	
Coating	TiCN*	TiCN*
Type	TMU SP	TMU SP
Shank	HA	HB
Coolant delivery	axial	axial

Material		Suitability
P	Steel	●
M	Stainless steel	●
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	●
H	Hardened steel	○

●=Optimal ○=Secondary

For internal and external threading



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

TPI	D Ø	d1 mm	d2 mm	l1 mm	l5 mm	l2 mm	No. of flutes	Code no.	EDP Number	EDP Number
19	≥ 1/4	9.95	10.00	70.00	25.00	16.00	4	10.190	9035420101900	9035570101900
14	≥ 1/2	15.95	16.00	90.00	40.00	25.00	5	16.140	9035420161400	9035570161400
11	≥ 1	19.95	20.00	105.00	50.00	33.00	5	20.110	9035420201100	9035570201100

See page 84 for machining parameters

See page 74 for tap/drill size info

Thread milling cutters without chamfer - Rc (BSPT) threads

Series **4770**

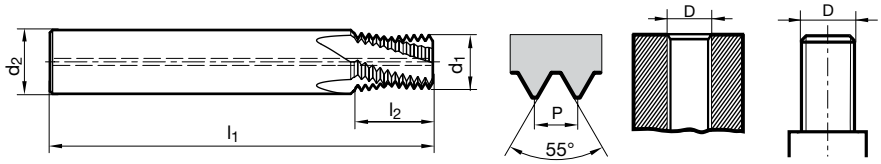
NEW

Tool material	**Solid Carbide**
Coating	TiCN*
Type	TM SP
Shank	HB
Coolant delivery	axial

Material		Suitability
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	●
S	Ni / Ti alloys	○
H	Hardened steel	○

●=Optimal ○=Secondary

For internal and external threading



** TiCN coated thread mills will transition to Sirius coating as stock is replenished*

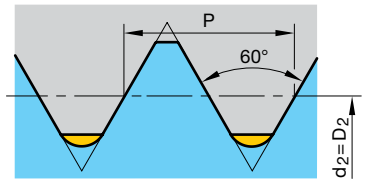
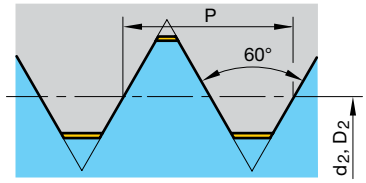
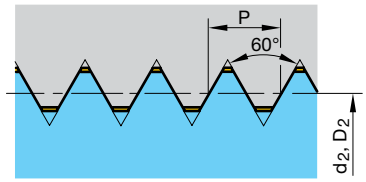
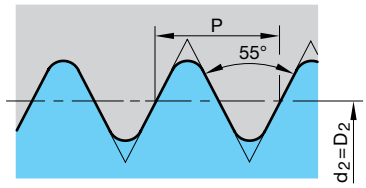
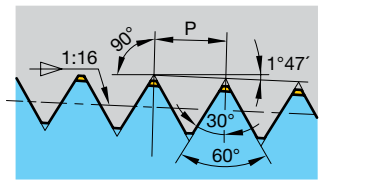
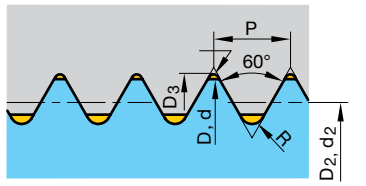
D Ø	TPI	d1 mm	d2 mm	l1 mm	l2 mm	No. of flutes	Code no.	EDP Number
≥ Rc 1/8	28	7.40	8.00	64.00	8.60	3	9.728	9047700097280
≥ Rc 1/4	19	9.12	10.00	74.00	14.04	4	13.157	9047700131570
≥ Rc 1/2	14	14.80	16.00	90.00	19.05	5	20.955	9047700209550
≥ Rc 1	11	18.00	20.00	105.00	33.40	5	33.249	9047700332490

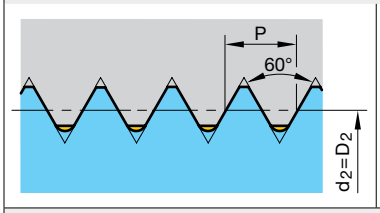
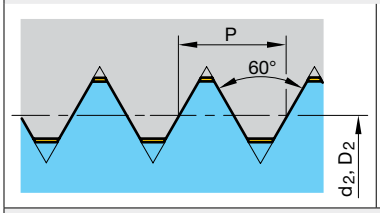
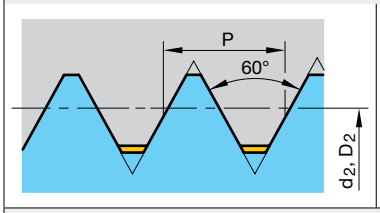
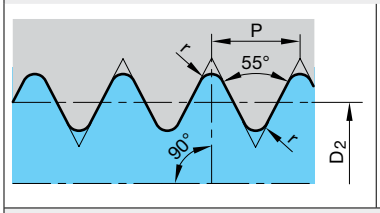
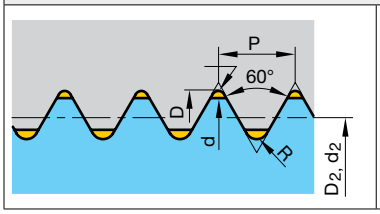
See page 84 for machining parameters

See page 74 for tap/drill size info

TECHNICAL INFORMATION

The characteristics of different thread types

geometry drawing	Standard	application
M ISO-metric thread		
	DIN 13-1	General standard thread
UNC Unified National Coarse thread		
	ASME B1.1	General UN standard thread
UNEF Unified National Extra Fine thread		
	ASME B1.1	General UN Extra Fine thread
G Cylindrical Pipe thread without thread sealing connections		
	DIN EN ISO 228-1	Threads for pipes, pipe connections and fittings
NPT American Standard Pipe Threads tapered for sealing		
	ANSI/ ASME B1.20.1	pipe threads and fittings
MJ thread metric thread		
	DIN ISO 5855-1	For the aero space industry

geometry drawing	Standard	application
MF ISO-metric fine thread		
	DIN 13-2 to DIN 13-11	General fine thread
UNF Unified National Fine thread		
	ASME B1.1 ISO-metric trapezoidal thread	General UN Fine thread
UNS Unified Special thread		
	ASME B1.1	General UN Special thread
Rp Whitworth pipe thread cylindrical internal thread		
	DIN EN 10226-1 (based on ISO 7-1) Replace-ment for DIN 2999-1	Internal thread for pipe threads and fittings (for in the thread sealing connections)
UNJ inch thread		
	ISO 3161	For the aero space industry

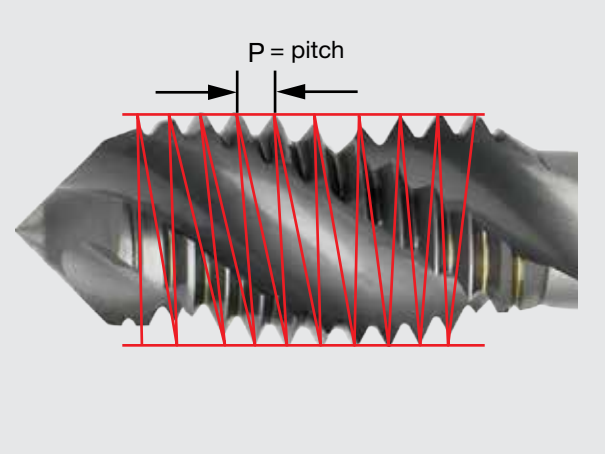
external thread

internal thread

play

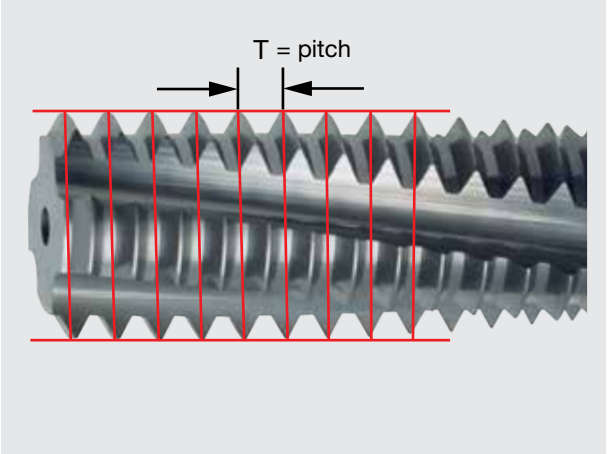
Difference between taps/fluteless taps and thread milling cutters

Taps/fluteless taps



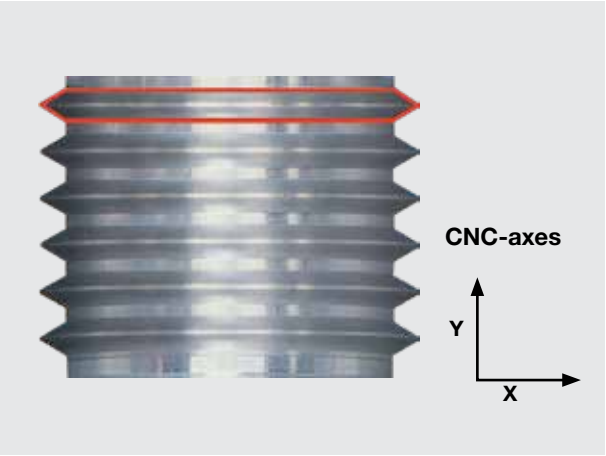
The red lines show the pitch angle of the thread that is ground into the tool. This means the pitch is cut into the workpiece by the tool.

Thread milling cutter

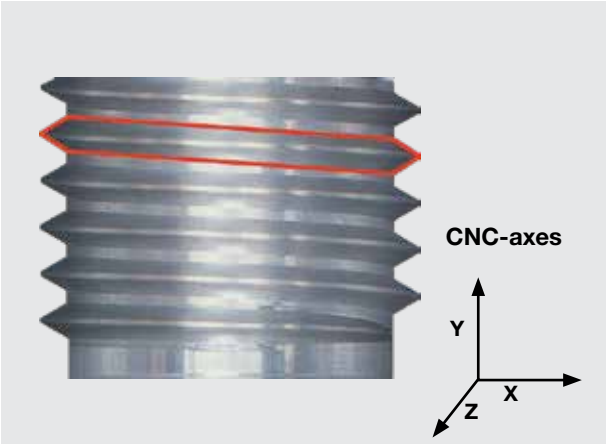


The red lines show that the tool does not possess a pitch angle. The pitch is produced by the Z-axis of a CNC machine.

Creation of the thread with thread milling



Thread profile without axial feed (Z-axis) of the machine. A groove profile is created without pitch. A functioning thread is not created.



Through the additional programming of the Z-axis the necessary pitch is produced.

Note:
Due to diagonal milling in the pitch angle **(Z-axis)** the thread profile of the tool is **transferred onto the component distorted.**
The more the milling cutter diameter (80% of nom. Ø) approaches the nominal thread diameter and the higher the thread pitch the more pronounced the profile distortion is.

Drill size for thread milling cutters

Std. ISO metric threads DIN 13

nom. Ø	pitch P mm	Tapping size hole Ø DIN 336 mm	core diameter of int. thread 6H* min. mm	max. mm
M 1	0.25	**0.75**	0.729	0.785
M 1.1	0.25	**0.85**	0.829	0.885
M 1.2	0.25	**0.95**	0.929	0.985
M 1.4	0.30	**1.10**	1.075	1.142
M 1.6	0.35	**1.25**	1.221	1.321
M 1.8	0.35	**1.45**	1.421	1.521
M 2	0.40	**1.60**	1.567	1.679
M 2.2	0.45	**1.75**	1.713	1.838
M 2.5	0.45	**2.05**	2.013	2.138
M 3	0.50	**2.50**	2.459	2.599
M 3.5	0.60	**2.90**	2.850	3.010
M 4	0.70	**3.30**	3.242	3.422
M 4.5	0.75	**3.70**	3.688	3.878
M 5	0.80	**4.20**	4.134	4.334
M 6	1.00	**5.00**	4.917	5.153
M 7	1.00	**6.00**	5.917	6.153
M 8	1.25	**6.80**	6.647	6.912
M 9	1.25	**7.80**	7.647	7.912
M 10	1.50	**8.50**	8.376	8.676
M 11	1.50	**9.50**	9.376	9.676
M 12	1.75	**10.20**	10.106	10.441
M 14	2.00	**12.00**	11.835	12.210
M 16	2.00	**14.00**	13.835	14.210
M 18	2.50	**15.50**	15.294	15.744
M 20	2.50	**17.50**	17.294	17.744
M 22	2.50	**19.50**	19.294	19.744
M 24	3.00	**21.00**	20.752	21.252
M 27	3.00	**24.00**	23.752	24.252
M 30	3.50	**26.50**	26.211	26.771
M 33	3.50	**29.50**	29.211	29.771
M 36	4.00	**32.00**	31.670	32.270
M 39	4.00	**35.00**	34.670	35.270
M 42	4.50	**37.50**	37.129	37.799
M 45	4.50	**40.50**	40.129	40.799
M 48	5.00	**43.00**	42.587	43.297
M 52	5.00	**47.00**	46.587	47.297
M 56	5.50	**50.50**	50.046	50.796

* M 1.1 up to M 1.4 tapping size hole of int. thread 5H

ISO metric fine threads DIN 13

nom.- Ø	x pitch P mm	Tapping size hole Ø DIN 336 mm	core diameter of int. thread 6H min. mm	max. mm
M 2.5	x 0.35	**2.15**	2.121	2.221
M 3.0	x 0.35	**2.65**	2.621	2.721
M 3.5	x 0.35	**3.15**	3.121	3.221
M 4.0	x 0.50	**3.50**	3.459	3.599
M 4.5	x 0.50	**4.00**	3.959	4.099
M 5.0	x 0.50	**4.50**	4.459	4.599
M 5.5	x 0.50	**5.00**	4.959	5.099
M 6.0	x 0.75	**5.20**	5.188	5.378
M 7.0	x 0.75	**6.20**	6.188	6.378
M 8.0	x 0.50	**7.50**	7.459	7.599
M 8.0	x 0.75	**7.20**	7.188	7.378
M 8.0	x 1.00	**7.00**	6.917	7.153
M 9.0	x 0.75	**8.20**	8.188	8.378
M 9.0	x 1.00	**8.00**	7.917	8.153
M 10	x 0.75	**9.20**	9.188	9.378
M 10	x 1.00	**9.00**	8.917	9.153
M 10	x 1.25	**8.80**	8.647	8.912
M 11	x 0.75	**10.20**	10.188	10.378
M 11	x 1.00	**10.00**	9.917	10.153
M 12	x 1.00	**11.00**	10.917	11.153
M 12	x 1.25	**10.80**	10.647	10.912
M 12	x 1.50	**10.50**	10.376	10.676
M 14	x 1.00	**13.00**	12.917	13.153
M 14	x 1.25	**12.80**	12.647	12.912
M 14	x 1.50	**12.50**	12.376	12.676
M 15	x 1.00	**14.00**	13.917	14.153
M 15	x 1.50	**13.50**	13.376	13.676
M 16	x 1.00	**15.00**	14.917	15.153
M 16	x 1.25	**14.80**	14.647	14.912
M 16	x 1.50	**14.50**	14.376	14.676
M 17	x 1.00	**16.00**	15.917	16.153
M 17	x 1.50	**15.50**	15.376	15.676
M 18	x 1.00	**17.00**	16.917	17.153
M 18	x 1.50	**16.50**	16.376	16.676
M 20	x 1.00	**19.00**	18.917	19.153
M 20	x 1.50	**18.50**	18.376	18.676
M 20	x 2.00	**18.00**	17.835	18.210
M 22	x 1.00	**21.00**	20.917	21.153
M 22	x 1.50	**20.50**	20.376	20.676
M 22	x 2.00	**20.00**	19.835	20.210
M 24	x 1.00	**23.00**	22.917	23.153
M 24	x 1.50	**22.50**	22.376	22.676
M 24	x 2.00	**22.00**	21.835	22.210
M 25	x 1.00	**24.00**	23.917	24.153
M 25	x 1.50	**23.50**	23.376	23.676
M 25	x 2.00	**23.00**	22.835	23.210
M 27	x 1.00	**26.00**	25.917	26.153
M 27	x 1.50	**25.50**	25.376	25.676
M 27	x 2.00	**25.00**	24.835	25.210
M 28	x 1.00	**27.00**	26.917	27.153
M 28	x 1.50	**26.50**	26.376	26.676
M 28	x 2.00	**26.00**	25.835	26.210
M 30	x 1.00	**29.00**	28.917	29.153
M 30	x 1.50	**28.50**	28.376	28.676
M 30	x 2.00	**28.00**	27.835	28.210
M 30	x 3.00	**27.00**	26.752	27.252
M 32	x 1.50	**30.50**	30.376	30.676
M 32	x 2.00	**30.00**	29.835	30.210
M 33	x 1.50	**31.50**	31.376	31.676
M 33	x 2.00	**31.00**	30.835	31.210
M 33	x 3.00	**30.00**	29.752	30.252
M 35	x 1.50	**33.50**	33.376	33.676
M 36	x 1.50	**34.50**	34.376	34.676

UNC-threads ASME B1.1

nom. Ø	threads per inch	Tapping size hole Ø DIN 336 mm	core diameter of int. thread 2B min. mm	max. mm
Nr. 1	- 64	**1.55**	1.425	1.580
Nr. 2	- 56	**1.85**	1.694	1.872
Nr. 3	- 48	**2.10**	1.941	2.146
Nr. 4	- 40	**2.35**	2.157	2.385
Nr. 5	- 40	**2.65**	2.487	2.698
Nr. 6	- 32	**2.85**	2.642	2.896
Nr. 8	- 32	**3.50**	3.302	3.531
Nr. 10	- 24	**3.90**	3.683	3.937
Nr. 12	- 24	**4.50**	4.343	4.597
1/4	- 20	**5.10**	4.978	5.258
5/16	- 18	**6.60**	6.401	6.731
3/8	- 16	**8.00**	7.798	8.153
7/16	- 14	**9.40**	9.144	9.550
1/2	- 13	**10.80**	10.592	11.024
9/16	- 12	**12.20**	11.989	12.446
5/8	- 11	**13.50**	13.386	13.868
3/4	- 10	**16.50**	16.307	16.840
7/8	- 9	**19.50**	19.177	19.761
1	- 8	**22.25**	21.971	22.606
1 1/8	- 7	**25.00**	24.638	25.349
1 1/4	- 7	**28.00**	27.813	28.524
1 3/8	- 6	**30.75**	30.353	31.115
1 1/2	- 6	**34.00**	33.528	34.290
1 3/4	- 5	**39.50**	38.938	39.802
2	- 4.5	**45.00**	44.679	45.593

UNJC-threads ISO 3161

nom. Ø	threads per inch	tapping size hole Ø mm	core diameter of int. threads 3B min. mm	max. mm
Nr. 6	- 32	**2.85**	2.733	2.939
Nr. 8	- 32	**3.55**	3.393	3.599
Nr. 10	- 24	**4.00**	3.795	4.064
Nr. 12	- 24	**4.60**	4.455	4.704
1/4	- 20	**5.30**	5.113	5.387
5/16	- 18	**6.75**	6.563	6.833
3/8	- 16	**8.20**	7.978	8.255
7/16	- 14	**9.60**	9.346	9.639
1/2	- 13	**11.00**	10.798	11.095
9/16	- 12	**12.40**	12.228	12.482
5/8	- 11	**13.80**	13.627	13.904

UNJF-Threads ISO 3161

nom. Ø	threads per inch	tapping size hole Ø mm	Kern-Ø Innengewinde 3B min. mm	max. mm
Nr. 6	- 40	**3.00**	2.888	3.053
Nr. 8	- 36	**3.60**	3.480	3.663
Nr. 10	- 32	**4.20**	4.054	4.255
Nr. 12	- 28	**4.75**	4.602	4.816
1/4	- 28	**5.60**	5.466	5.662
5/16	- 24	**7.00**	6.906	7.109
3/8	- 24	**8.60**	8.494	8.679
7/16	- 20	**10.00**	9.876	10.084
1/2	- 20	**11.60**	11.463	11.661
9/16	- 18	**13.00**	12.913	13.122
5/8	- 18	**14.60**	14.501	14.702

(Whitworth - BSPP) threads (DIN-ISO 228-1)

nom. Ø inch	threads per inch	tapping size hole Ø mm	core diameter of int. thread min. mm	max. mm
G 1/16	28	**6.80**	6.561	6.843
G 1/8	28	**8.80**	8.566	8.848
G 1/4	19	**11.80**	11.445	11.890
G 3/8	19	**15.25**	14.950	15.395
G 1/2	14	**19.00**	18.631	19.172
G 5/8	14	**21.00**	20.587	21.128
G 3/4	14	**24.50**	24.117	24.658
G 7/8	14	**28.25**	27.877	28.418
G 1	11	**30.75**	30.291	30.931
G 1 1/8	11	**35.50**	34.939	35.579
G 1 1/4	11	**39.50**	38.952	39.592
G 1 1/2	11	**45.25**	44.845	45.485
G 1 3/4	11	**51.00**	50.788	51.428
G 2	11	**57.00**	56.656	57.296

MJ threads DIN ISO 5855

nom. Ø	x pitch P mm	tapping size hole Ø mm	core diameter of int. threads 5H* min. mm	max. mm
MJ 3	x 0.50	**2.60**	2.513	2.653
MJ 4	x 0.70	**3.40**	3.318	3.498
MJ 5	x 0.80	**4.30**	4.221	4.421
MJ 6	x 0.50	**5.55**	5.513	5.625
MJ 6	x 0.75	**5.35**	5.269	5.419
MJ 6	x 1.00	**5.10**	5.026	5.216
MJ 8	x 0.50	**7.55**	7.513	7.625
MJ 8	x 0.75	**7.35**	7.269	7.419
MJ 8	x 1.00	**7.10**	7.026	7.216
MJ 8	x 1.25	**6.90**	6.782	6.994
MJ 10	x 1.00	**9.10**	9.026	9.216
MJ 10	x 1.25	**8.90**	8.782	8.994
MJ 10	x 1.50	**8.60**	8.539	8.775
MJ 12	x 1.75	**10.40**	10.295	10.560
MJ 16	x 2.00	**14.20**	14.051	14.351

Drill size for thread milling cutters

UNF-threads ASME B1.1

nom. Ø	threads per inch	tapping size hole Ø DIN 336 mm	core diameter of int. thread 2B min. mm	core diameter of int. thread 2B max. mm
Nr. 1	72	**1.55**	1.473	1.610
Nr. 2	64	**1.85**	1.755	1.910
Nr. 3	56	**2.15**	2.024	2.197
Nr. 4	48	**2.40**	2.271	2.459
Nr. 5	44	**2.70**	2.550	2.741
Nr. 6	40	**2.95**	2.819	3.023
Nr. 8	36	**3.50**	3.404	3.607
Nr. 10	32	**4.10**	3.962	4.166
Nr. 12	28	**4.60**	4.496	4.724
1/4	28	**5.50**	5.359	5.588
5/16	24	**6.90**	6.782	7.036
3/8	24	**8.50**	8.382	8.636
7/16	20	**9.90**	9.728	10.033
1/2	20	**11.50**	11.328	11.608
9/16	18	**12.90**	12.751	13.081
5/8	18	**14.50**	14.351	14.681
3/4	16	**17.50**	17.323	17.678
7/8	14	**20.40**	20.269	20.650
1	12	**23.25**	23.114	23.571
1 1/8	12	**26.50**	26.289	26.746
1 1/4	12	**29.50**	29.464	29.921
1 3/8	12	**32.75**	32.639	33.096
1 1/2	12	**36.00**	35.814	36.271

UNC (UNC-STI) EG-threads for wire thread inserts ASME B18.29.1

nom. Ø	threads per inch	tapping size hole Ø mm	core diameter of int. thread min. mm	core diameter of int. thread max. mm
EG Nr. 6	32	**3.80**	3.678	3.879
EG Nr. 8	32	**4.40**	4.338	4.524
EG Nr. 10	24	**5.20**	5.055	5.283
EG Nr. 12	24	**5.80**	5.715	5.944
EG 1/4	20	**6.70**	6.624	6.868
EG 5/16	18	**8.40**	8.242	8.489
EG 3/8	16	**10.00**	9.868	10.127
EG 7/16	14	**11.60**	11.506	11.783
EG 1/2	13	**13.30**	13.122	13.393
EG 9/16	12	**14.90**	14.747	15.032
EG 5/8	11	**16.50**	16.375	16.673

EG UNF (UNF-STI) threads for wire thread inserts ASME B18.29.1

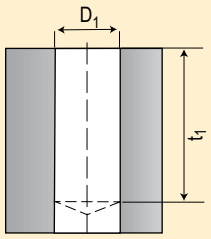
nom. Ø	threads per inch	tapping size hole Ø mm	core diameter of int. thread min. mm	core diameter of int. thread max. mm
EG Nr. 6	40	**3.70**	3.644	3.818
EG Nr. 8	36	**4.40**	4.321	4.498
EG Nr. 10	32	**5.10**	4.999	5.184
EG Nr. 12	28	**5.70**	5.682	5.809
EG 1/4	28	**6.60**	6.546	6.721
EG 5/16	24	**8.25**	8.166	8.352
EG 3/8	24	**9.80**	9.754	9.931
EG 7/16	20	**11.50**	11.389	11.585
EG 1/2	20	**13.10**	12.974	13.172
EG 9/16	18	**14.70**	14.592	14.798
EG 5/8	18	**16.25**	16.180	16.386

Metric/metric fine EG-threads (EG M14 x 1.25) for wire thread inserts DIN 8140

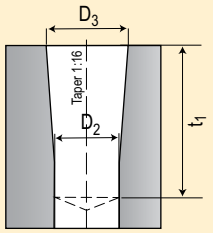
nom. Ø	x pitch P mm	tapping size hole Ø mm	core diameter of int. thread min. mm	core diameter of int. thread max. mm
EG M 4	0.70	**4.20**	4.152	4.292
EG M 5	0.80	**5.25**	5.174	5.334
EG M 6	1.00	**6.30**	6.217	6.407
EG M 8	1.25	**8.40**	8.271	8.483
EG M10	1.50	**10.50**	10.324	10.560
EG M12	1.75	**12.50**	12.379	12.644
EG M14 x	1.25	**14.40**	14.271	14.483
EG M16	2.00	**16.50**	16.433	16.733

Tapered Pipe Drill Sizes

Drilling cylindrically without using a reamer



Drilling cylindrically and reaming conically using a reamer



NPT

Nominal Size	Threads per Inch	D1 inch	D2 inch	D3 inch	t1 inch
1/16	27	0.2421	0.2343	0.2516	0.4724
1/8	27	0.3346	0.3248	0.3441	0.4724
1/4	18	0.4331	0.4232	0.4472	0.6890
3/8	18	0.5709	0.5551	0.5827	0.6929
1/2	14	0.7028	0.6890	0.7213	0.9016
3/4	14	0.9134	0.8937	0.9319	0.9055
1	11 1/2	1.1417	1.1260	1.1689	1.0787
1 1/4	11 1/2	1.4882	1.4685	1.5138	1.1063
1 /2	11 1/2	1.7323	1.7087	1.7528	1.1181
2	11 1/2	2.2047	2.1850	2.2268	1.1181

Rc

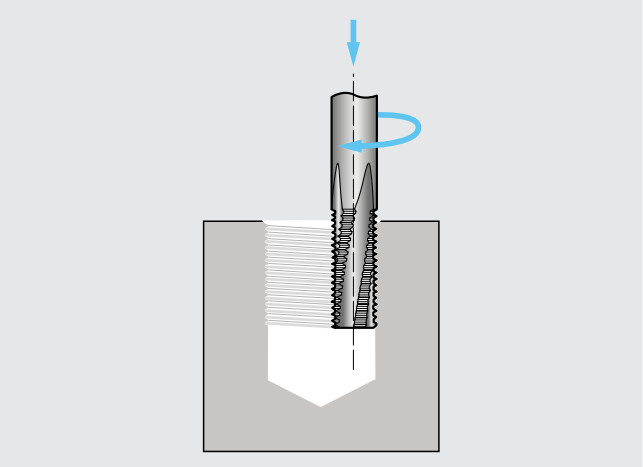
Nominal Size	Threads per Inch	D1 inch	D2 inch	D3 inch	t1 inch
Rc 1/16	28	0.2421	0.2402	0.2583	0.4370
Rc 1/8	28	0.3209	0.3189	0.3374	0.4370
Rc 1/4	19	0.4272	0.4232	0.4508	0.6417
Rc 3/8	19	0.5630	0.5610	0.5886	0.6575
Rc 1/2	14	0.7008	0.6969	0.7335	0.8780
Rc 3/4	14	0.9134	0.9094	0.9496	0.9291
Rc 1	11	1.1496	1.1457	1.1925	1.1142

NPTF

Nominal Size	Threads per Inch	D1 inch	D2 inch	D3 inch	t1 inch
1/16	27	0.2402	0.2343	0.2524	0.4724
1/8	27	0.3327	0.3248	0.3449	0.4724
1/4	18	0.4291	0.4232	0.4488	0.6890
3/8	18	0.5630	0.5551	0.5843	0.6929
1/2	14	0.6929	0.6890	0.7217	0.9016
3/4	14	0.9055	0.8937	0.9323	0.9055
1	11 1/2	1.1319	1.1260	1.1701	1.0787
1 1/4	11 1/2	1.4764	1.4685	1.5150	1.1063
1 /2	11 1/2	1.7224	1.7087	1.7539	1.1181
2	11 1/2	2.1949	2.1850	2.2280	1.1181

Reverse rotation milling

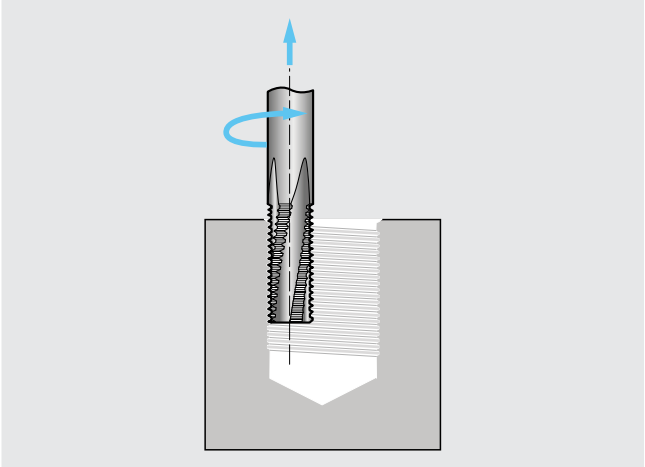
clockwise, with G02



Reverse rotation milling is preferentially applied for the machining of harder materials or to remedy taper threads.

Synchronous milling

counter clockwise, with G03

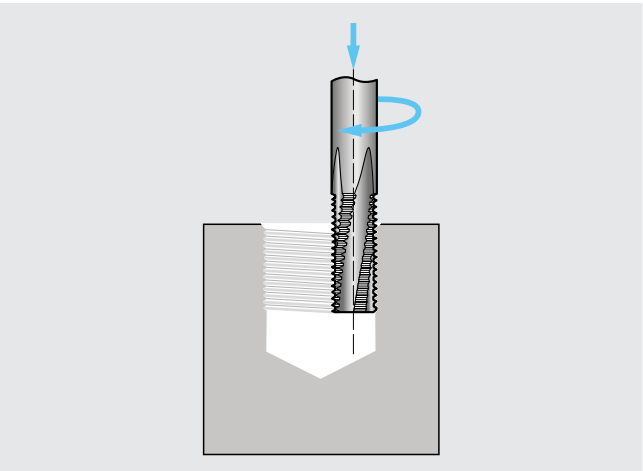


Synchronous milling is applied with thread depths smaller than 1.5xD.
Advantage: A better surface finish is achieved.

Thread production with one tool

Right-hand thread

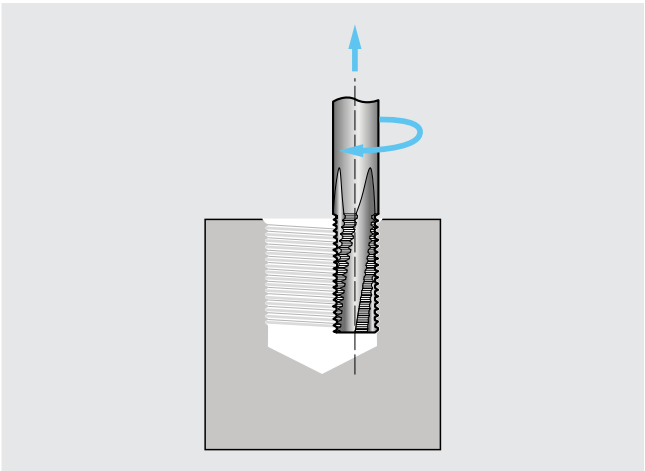
Reverse rotation milling



Tool rotates clockwise from top to bottom

Left-hand thread

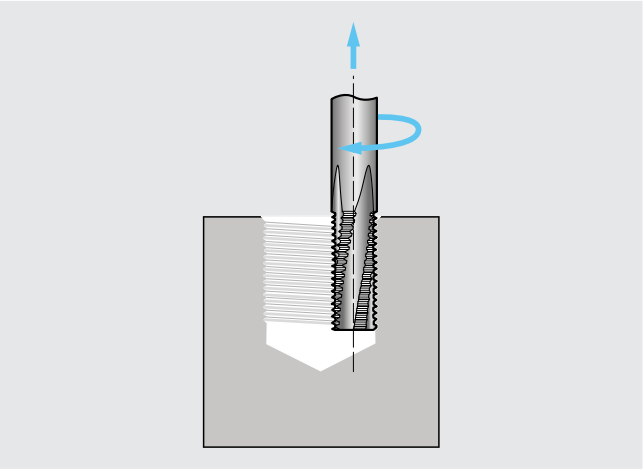
Reverse rotation milling



Tool rotates clockwise from bottom to top

Right-hand thread

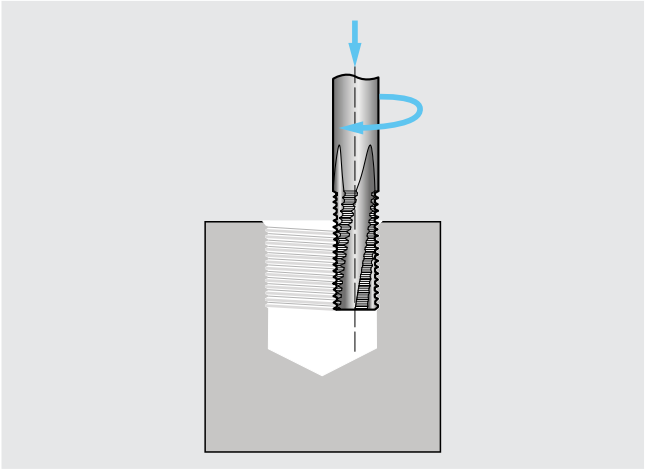
Synchronous milling



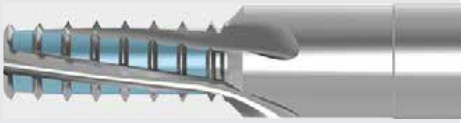
Tool rotates clockwise from bottom to top

Left-hand thread

Synchronous milling



Tool rotates clockwise from top to bottom

Illustration	Modification	Effect
	Cooling slots on shank	Targeted cooling, without weakening the tool cross-section in the cutting edge area
	Radial coolant exits	Targeted cooling with through hole threads
	Threads removed	Reduced cutting forces but longer machining time because two cycles are required
	De-burring cutting edge	Removing the incomplete threads at the thread run-in without additional operating step
	First thread profile lengthened at the face	Chamfering a tapping size hole
	Grinding collar	Enables axial distribution of cuts – useful for deep threads

Thread milling programming

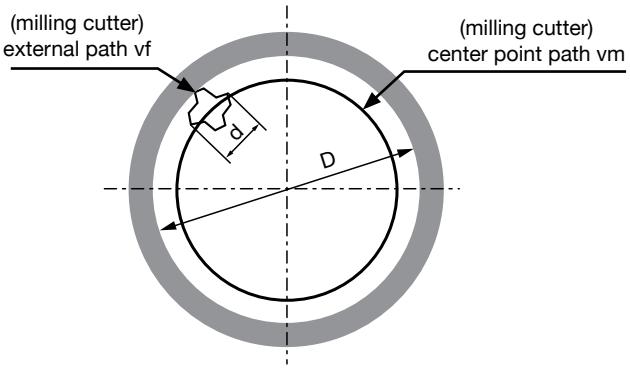
Program specifications

Thread milling functions

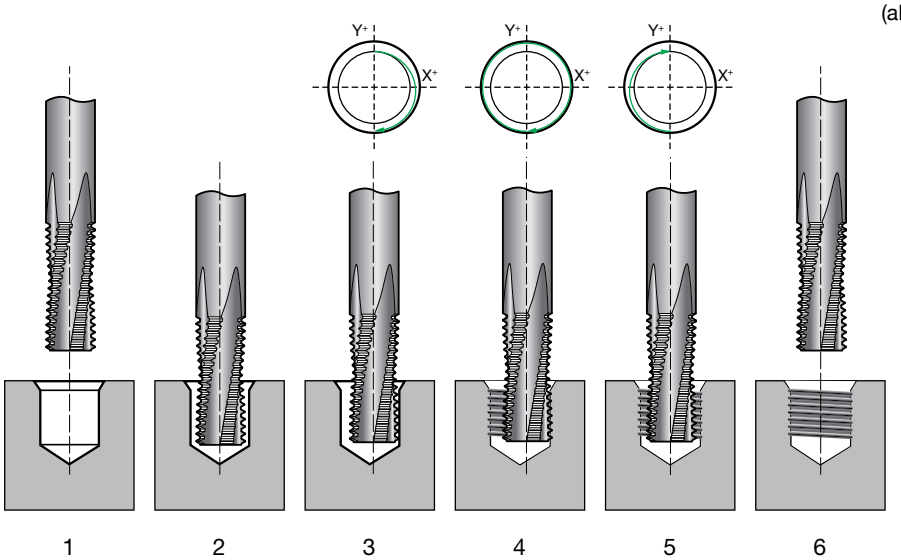
G00	Rapid movement	**G90**	Absolute dimension
G01	Feed	**G91**	Incremental dimension
G02	Circular interpolation (clockwise)	**M03**	Spindle on (clockwise rotation)
G03	Circular interpolation (anti-clockwise)	**M05**	Spindle stop
G17	Layer selection x-y axis	**M08**	Coolant on
G18	Layer selection z-x axis	**X**	Axis
G19	Layer selection y-z axis	**Y**	Axis
G40	Cancel tool correction	**Z**	Axis
G41	Tool path correction (left of contour)	**I**	Thread pitch parallel to X-axis
G42	Tool path correction (right of contour)	**J**	Thread pitch parallel to Y-axis
G43	Tool length compensation (call-up)	**S**	Spindle speed
G49	Tool length compensation (deselect)	**F**	Feed
G54	Work offset		

CNC internal thread milling

1. Moving to start position
2. Moving to thread depth in bore
3. 180° descending loop to contour
4. 360° full circular movement of thread milling cutter
5. 180° exit loop to center of bore
6. Rapid movement from bore to start position



entry cycle 180°
(always half feed rate)



Formula of calculation

$$v_c = \frac{d \cdot \pi \cdot n}{1000}$$

$$n = \frac{v_c \cdot 1000}{d \cdot \pi}$$

$$v_f = n \cdot z \cdot f_z$$

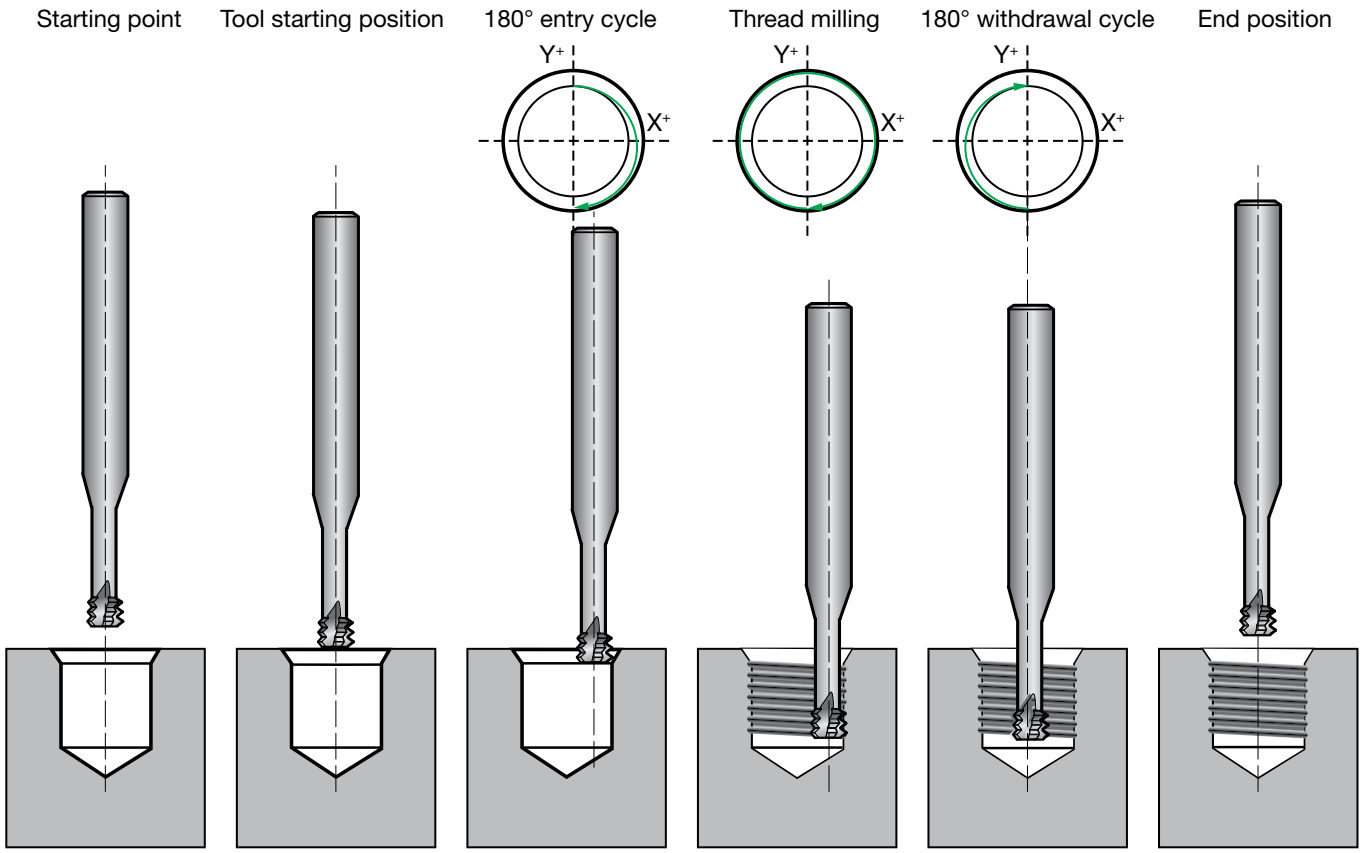
$$v_m = \frac{v_f \cdot (D - d)}{D}$$

$$v_b = n \cdot f_b$$

vc = cutting speed
vf = contour feed
vm = centre point path feed
n = revolutions
z = number of teeth
fz = feed per tooth
fb = feed per drill per revolution* vb = drill feed rate*
D = Ø nom. of thread [mm]
d = milling cutter nom. Ø [mm]
* for drill/thread milling

Thread milling programming

Programming process for micro-thread milling (right-hand thread in reverse rotation)



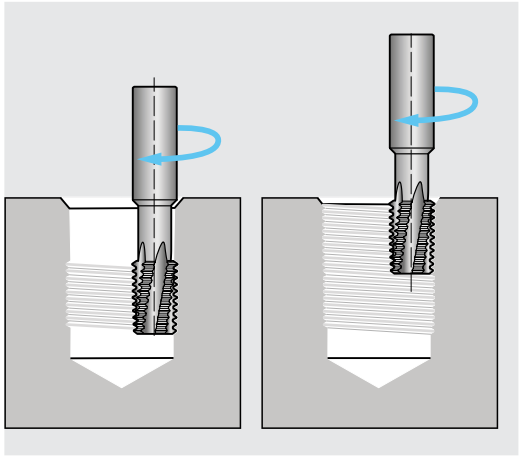
Possibilities to reduce radial forces

To reduce radial forces cut distribution can be undertaken:

Advantage:
- for larger thread depths
- counteracts taper threads
- for unstable clamping conditions

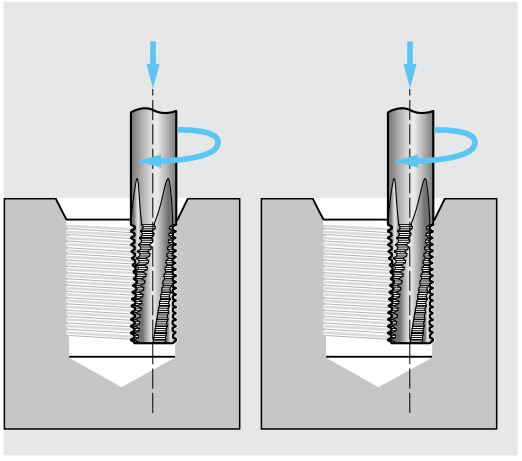
Disadvantage:
- increased tool wear
- longer production time

Axial distribution of cut



1st step 2nd step

Radial distribution of cut



1st step 2nd step

1st step reverse rotation milling

2nd step reverse rotation milling

Selecting the correct clamping chuck

Correct tool clamping also plays a essential role with thread milling. Thread milling cutters should as a rule be clamped as short as possible. A compact and mechanical clamping force is preferable. The error in concentricity should not exceed 0.02 millimeters.

Power chucks

A power chuck excels thanks to extremely accurate concentricity. The high clamping forces and optimal smooth running are a perfect prerequisite for the production of threads in all materials including a high pitch.

max. permissible error in concentricity: 0.003 mm

Side lock holders

A side lock holder for HB and HE shanks is a robust, cost-efficient clamping chuck with a maximum clamping force. The clamping surface prevents the tool twisting or being pulled out during machining. Therefore, side lock holders are suitable for the production in all materials including a high pitch.

max. permissible error in concentricity: 0.002 mm

Shrink fit chucks

A shrink fit chuck creates a rigid connection with the shrink fitted tool. Incorrect shrink fitting or older shrink fit chucks can result in the pulling out of the tool. Tool breakage and possible loss of the component would be the consequence. Therefore, the shrink fit chuck is only suitable for a thread pitch < P=1.5 mm.

max. permissible error in concentricity: 0.005 mm

Hydraulic chucks

A hydraulic chuck, similar to the shrink fit chuck, has only limited suitability for thread milling. Especially with high radial forces this clamping chuck reaches its limits. Therefore, the hydraulic chuck is recommended for softer materials such as aluminum and a thread pitch < P=1.5 mm.

max. permissible error in concentricity: 0.005 mm

Collet holders

Collet chucks are very well suited for micro-thread milling because only axial stresses are created. The low clamping forces only permit the milling of softer materials. Consequently, collet holders are not suitable for conventional thread milling.

max. permissible error in concentricity: 0.01 mm

Practical application of thread milling cutters

1.) Tool clamping:
good concentricity is important, therefore clamping as short and rigid as possible

2.) Enter tool data in machine memory
1.) Tool length from the front face, take drill/thread milling cutters (DTMC) rom point.
2.) Measure tool radius with tool pre-setting equipment. General rule: measured radius - 0.022 x pitch provides the input value in machine memory.

3.) Input of CNC program in control
(preferably integrated as sub-program at corresponding positions)
a.) Call-up of a self-controlling cycle (procedures should be known)
b.) Integration of data file from our threadmill-software (DIN or Haidenhain).

4.) Trial run over workpiece
a) Tool length dimension in memory extending by an approximate value dependent on contact length (i.e. 30 mm) or offset zero point.
b) Run program in single set, visual check of travel path.
c) Allow program to run in automatic mode.

Attention:
With controls where it is not definitely clear what milling path is assigned it must be clarified if the feed is positioned on the external path vf or at the center path vm. As a rule we specify the milling center point path vm.

5.) Application in workpiece
Re-set the tool extension or the zero point. Then allow the program to run in the workpiece the feed regulation must be 100% selected. Should the thread not be true to gauge, the tool radius requires correction in the tool memory:
Example:
- thread too tight: Radius correction – input
- thread too large: Radius correction + input

	Material group	Examples
P	Common structural steels	A283, A516, Gr50, 30, 35, 42, 45, 50, 55, 60, 65, 70, 75 , 80, 85, 90, 100, 110, 135, 140, 145, 150, 160
	Free-cutting steels	1151, 1215, L10, 10L10, 10L15, 10L17, 10L20, 10L23, 10L25, 10L30, 10L35, 10L40, 10L42, 10L45, 10L49, 10L50, 10L55, 11L15, 11L16, 11L17, 11L37, 11L38, 11L39, 11L41, 11L44, 11L46, 12L11, 12L12, 12L13, 12L14, 12L15, 41L25, 41L30, 41L35, 41L40, 41L42, 41L47, 41L50 51L15, 51L17, 51L20, 86L20, 86L40
	Unalloyed heat-treatable steels	1005, 1006, 1008, 1009, 1010, 1011, 1012, 1013, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1025, 1026, 1029, 1030, 1033, 1035, 1037, 1038, 1039, 1040, 1042, 1043, 1044, 1045, 1046, 1049, 1050, 1053, 1055, 1059, 1060, 1064, 1065, 1069, 1070, 1071, 1074, 1075, 1078, 1080, 1084, 1085, 1086, 1090, 1095
	Alloyed heat-treatable steels	1330, 1335, 1340, 1345, 2340, 3140, 3145, 3150, 3230, 3240, 3335, 3340, 3435, 3450, 4032, 4037, 4063, 4130, 4135, 4137, 4140, 4142, 4145, 4147, 4150, 4161, 4337, 4340, 4640, 5045, 5046, 5060, 5130, 5132, 5135, 5140, 5145, 5157, 5150, 5155, 5160, 6130, 6135, 6140, 6145, 6150, 7140, 6145, 6150, 7140, 8630, 8632, 8635, 8637, 8640, 8642, 8645, 8650, 8650, 8660, 8735, 8740, 8742, 9250, 9254, 9255, 9260, 9262, 9840, 9850
	Unalloyed case hardened steels	1005, 1006, 1008, 1009, 1010, 1011, 1012, 1013, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1025, 1026, 1029, 1030, 1033, 1035, 1037, 1038, 1039, 1040, 1042, 1043, 1044, 1045, 1046, 1049, 1050, 1053, 1055, 1059, 1060, 1064, 1065, 1069, 1070, 1071, 1074, 1075, 1078, 1080, 1084, 1085, 1086, 1090, 1095
	Alloyed case hardened steels	2317, 2512, 2515, 2517, 3115, 3120, 3215, 3220, 3312, 3316, 3325, 4012, 4023, 4024, 4027, 4028, 4118, 4119, 4125, 4317, 4320, 4419, 4422, 4427, 4608, 4615, 4617, 4620, 4621, 4626, 4718, 4720, 4815, 4817, 4820, 5015, 5115, 5117, 5120, 6115, 6118, 6120, 6125, 8115, 8615, 8617, 8620, 8622, 8625, 8627, 8720, 8822, 9310, 9315, 9317
	Nitriding steels	1132, 1137, 1138, 1139, 1140, 1141, 1144, 1145, 1146, 1151
	Tool steels	A2, A3, A4, A5, A6, A8, A9, A10, O1, O2, O6, O7, A7, D2, D3, D4, D5, D7, H10, H11, H12, H13, H14, H19, H20, H21, H22, H23, H24, H25, H26, H41, H42, H43, L1, L3, W1, W2, W5
	High speed steels	M1, M2, M3-1, M3-2, M4, M6, M7, M10, M30, M33, M34, M36, M41, M42, M43, M44, M46, M47, T1, T2, T4, T5, T6, T8, T15
	Spring steels	5150, 5155, 6145, 6150, 9255
H	Hardened steels >48-60 Rc	Heat Treated Steels
M	Stainless steels, sulphured	203 Ez, 303 Se, 303 Ma, 303 Pb, 303 PlusX, 430F Se, 416 Se, 416 PlusX, 420F, 420F Se, 440F, 440F Se
	austenitic	201, 202, 301, 302B, 303, 304, 304L, 305, 308, 309, 309S, 310, 310S, 314, 316, 316L, 317, 321, 330, 347, 348, 384, 385, Nitronic 32, Nitronic 33, Nitronic 40, Nitronic 50, Nitronic 60, 17-7PH
	martensitic	403, 405, 410, 414, 416, 420, 422, 430, 431, 440A, 440B, 440C, 446, 501, 502, 630, Greek Ascoloy
K	Cast iron	A48-20 B, A48-30 B, A48-40 B, A48-50B, A159G1800, A159G2500, A159G3000, A159G3500, A159G4000
	Spheroidal graphite iron and malleable cast iron	60-10-18, 60-40-18, 65-45-12, 80-55-06, 100-70-03, 120-90-02, 32510, 35018, 40010, 50005, 60004, 70003, 80002, 90001, A220-70003, A220-8002, A536
	Chilled cast iron	
S	Special alloys	Inconel, Hastelloy, Monel, Nimonic, MAR-M246, DS-Ni, Waspalloy, Rene41
	Ti and Ti-alloys	Ti6AL4V, 5390A, TiCu2
N	Aluminium and Al-alloys	EC 1060, 1100, 1145, 1175, 1235, 2011, 2014, 2017, 2018, 2021, 2024, 2025, 2117, 2218, 2219, 2618, 3003, 3004, 3005, 4032, 4032-T6, 5005, 5050, 5052, 5056, 5083, 5086, 5154, 5252, 5254, 5454, 5456, 5457, 5652, 5657, 6053, 6061, 6061-T6, 6063, 6066, 6070, 6101, 6151, 6253, 6262, 6463, 6951, 7001, 7004, 7005, 7039, 7049, 7050, 7075, 7075-T6, 7079, 7175, 7178
	Al wrought alloys	1100-0, 3003-H18, 5056-0, 2024-T4, 4043-H18
	Al cast alloys	295-T6, 319-F, 356-T6, 380-F, 384-F, 390-F, 443-F, 413-F, 518-F, 713-TS, 850-TS
	Magnesium alloys	AZ31B, AZ63A, AZ80A, AZ91C, EZ33A, HK31A, QE22A, ZK60A
	Copper, low-alloyed	C10100, C27000, C71500, C52400, C77000, C17200, C71500, C95500, C86500
	Brass, short-chipping	CUZn10, CUZn20

Application recommendations thread milling cutters and micro thread milling cutters

ISO		Hardness HRC	Hardness Brinell	Cutting speed SFM	Milling part diameter [d1] / feed per tooth [IPT] Ø1 mm	Ø2 mm	Ø3 mm	Ø4 mm	Ø5 mm	Ø6 mm	Ø7 mm	Ø8 mm	Ø9 mm
P	Structural/free-cutting steels, Unalloyed heat-treatable-/ case hardened steels	< 22	< 220	300	0.0004	0.0008	0.0008	0.0010	0.0012	0.0014	0.0018	0.0020	0.0022
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	< 30	< 290	260	0.0004	0.0008	0.0008	0.0010	0.0012	0.0014	0.0018	0.0020	0.0022
	Alloyed heat-treatable steels, heat-treatable steels, high speed steels	< 38	<350	230	0.0004	0.0008	0.0008	0.0010	0.0012	0.0014	0.0018	0.0020	0.0022
M	Stainless steel sulfured, austenitic	< 30	< 290	180	0.0004	0.0008	0.0010	0.0012	0.0012	0.0012	0.0014	0.0016	0.0020
	Stainless and acid-resit. steel steels, martensitic	< 30	< 290	165	0.0004	0.0008	0.0010	0.0012	0.0012	0.0012	0.0014	0.0016	0.0020
	duplex and super duplex	< 40	< 375	150	0.0004	0.0008	0.0010	0.0012	0.0012	0.0012	0.0014	0.0016	0.0020
K	cast iron		< 300	400	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.002	0.0024
	Spher. graph. iron and mall. cast iron		< 350	330	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.002	0.0024
	ADI, GGV		< 350	260	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.002	0.0024
N	Aluminium and wrought alloys		30 - 150	820	0.0008	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026
	Aluminium- cast alloys	6-12 % silicon content	– –	750	0.0008	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026
	Magnesium alloys		< 150	600	0.0008	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026
	Copper and copper alloys		≤ 120	425	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022
	Copper special alloys		< 410	525	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022
	Plastics [thermoplastics, duroplastics]		– –	1000	0.0008	0.0012	0.0016	0.0018	0.0020	0.0022	0.0024	0.0028	0.0031
S	Titanium and titanium alloys		< 350	130	0.0004	0.0004	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0016
	Nickel, cobalt, iron alloys		< 410	100	0.0004	0.0004	0.0006	0.0008	0.0010	0.0012	0.0014	0.0016	0.0016
H	High tensile steels, hardened steels		< 55	150	x	0.0004	0.0006	0.0008	0.001	0.0012	0.0012	0.0014	0.0016
			< 62	165	x	0.0004	0.0006	0.0008	0.001	0.0012	0.0012	0.0014	0.0016

Ø10 mm	Ø12 mm	Ø14 mm	Ø16 mm	Ø18 mm	Ø20 mm	TM	TMC	TMU	MTM3	MTM1	MTMH3
0.0024	0.0024	0.0026	0.0026	0.0028	0.0031	●	●	●	●	●	●
0.0024	0.0024	0.0026	0.0026	0.0028	0.0031	●	●	●	●	●	●
0.0024	0.0024	0.0026	0.0026	0.0028	0.0031	○	●	●	●	●	●
0.0022	0.0024	0.0026	0.0026	0.0028	0.0030	○	●	●	●	●	●
0.0022	0.0024	0.0026	0.0026	0.0028	0.0030	○	●	●	●	●	●
0.0022	0.0024	0.0026	0.0026	0.0028	0.0030	○	●	●	●	●	●
0.0026	0.0028	0.0031	0.0035	0.0039	0.0047	●	●	●	●	●	●
0.0026	0.0028	0.0031	0.0035	0.0039	0.0047	●	●	●	●	●	●
0.0026	0.0028	0.0031	0.0035	0.0039	0.0047	●	●	●	●	●	●
0.0028	0.0031	0.0033	0.0035	0.0039	0.0047	●	●	●	●	●	●
0.0028	0.0031	0.0033	0.0035	0.0039	0.0047	●	●	●	●	●	●
0.0028	0.0031	0.0033	0.0035	0.0039	0.0047	●	●	●	●	●	●
0.0024	0.0026	0.0028	0.0030	0.0031	0.0035	●	●	●	●	●	●
0.0024	0.0024	0.0026	0.0028	0.0030	0.0031	●	●	●	●	●	●
0.0035	0.0035	0.0039	0.0047	0.0051	0.0059	●	●	●	●	●	●
0.0018	0.0020	0.0022	0.0024	0.0026	0.0028	●	●	●	●	●	●
0.0018	0.0020	0.0022	0.0024	0.0026	0.0028	●	●	●	●	●	●
0.0018	0.002	0.0022	0.0024	0.0026	0.0028	○	●	○	●	○	●
0.0018	0.002	0.0022	0.0024	0.0026	0.0028						●

● Optimal

○ Secondary

Application recommendations thread milling cutters
SC-TMC SP 2 xD IC

ISO		Hardness HRC	Hardness Brinell	Cutting speed SFM	Milling part diameter [d1] / feed per tooth [IPT]										
					Ø2 mm	**Ø3** mm	**Ø4** mm	**Ø5** mm	**Ø6** mm	**Ø7** mm	**Ø8** mm	**Ø9** mm	**Ø10** mm	**Ø12** mm	**Ø14** mm
P	Structural/free-cutting steels, Unalloyed heat-treatable-/ case hardened steels	< 22	< 220	330	0.0004	0.00059	0.0008	0.0008	0.0010	0.0010	0.0010	0.0012	0.0012	0.0014	0.0016
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	< 30	< 290	300	0.0004	0.00059	0.0008	0.0008	0.0010	0.0010	0.0010	0.0012	0.0012	0.0014	0.0016
	Alloyed heat-treatable steels, heat-treatable steels, high speed steels	< 38	<350	260	0.0004	0.00059	0.0008	0.0008	0.0010	0.0010	0.0010	0.0012	0.0012	0.0014	0.0016
M	Stainless steel sulfured, austenitic	< 30	< 290	195	0.0002	0.00039	0.0006	0.0006	0.0008	0.0008	0.0008	0.0010	0.0010	0.0012	0.0012
	Stainless and acid-resit. steel steels, martensitic	< 30	< 290	180	0.0002	0.00039	0.0006	0.0006	0.0008	0.0008	0.0008	0.0010	0.0010	0.0012	0.0012
	duplex and super duplex	< 40	< 375	165	0.0002	0.00039	0.0006	0.0006	0.0008	0.0008	0.0008	0.0010	0.0010	0.0012	0.0012
K	cast iron		< 300	400	0.0004	0.00079	0.0010	0.0012	0.0012	0.0014	0.0016	0.0016	0.0018	0.0020	0.0024
	Spher. graph. iron and mall. cast iron		< 350	330	0.0004	0.00079	0.0010	0.0012	0.0012	0.0014	0.0016	0.0016	0.0018	0.0020	0.0024
	ADI, GGV		< 350	295	0.0004	0.00079	0.0010	0.0012	0.0012	0.0014	0.0016	0.0016	0.0018	0.0020	0.0024
N	Aluminium and wrought alloys		Wrought Aluminum 30 - 80 75 - 50	--	--	--	--	--	--	--	--	--	--	--	--
	Aluminium- cast alloys	Silicon Content < 6% 6 - 12%		--	--	--	--	--	--	--	--	--	--	--	--
	Magnesium alloys		< 150	--	--	--	--	--	--	--	--	--	--	--	--
	Copper and copper alloys	long-chipping		295	0.0004	0.00059	0.0008	0.0008	0.0010	0.0010	0.0010	0.0012	0.0012	0.0014	0.0016
	Copper special alloys		< 410	230	0.0002	0.00039	0.0006	0.0006	0.0008	0.0008	0.0008	0.0010	0.0010	0.0012	0.0014
	Plastics [thermoplastics, duroplastics]	long-chipping		--	--	--	--	--	--	--	--	--	--	--	--
S	Titanium and titanium alloys		< 350	180	0.0004	0.00059	0.0006	0.0008	0.0010	0.0010	0.0010	0.0012	0.0012	0.0014	0.0014
	Nickel, cobalt, iron alloys		< 410	150	0.0002	0.00039	0.0004	0.0006	0.0008	0.0008	0.0008	0.0010	0.0010	0.0012	0.0012
H	High tensile steels, hardened steels		< 55	--	--	--	--	--	--	--	--	--	--	--	--
			< 62	--	--	--	--	--	--	--	--	--	--	--	--

Application recommendations thread milling cutters
SC-MTM3 2.5xD [Please note, M4 counter clockwise]

ISO		Hardness HRC	Hardness Brinell	Cutting speed SFM	Milling part diameter [d1] / feed per tooth [IPT]												
					Ø1 mm	**Ø2** mm	**Ø3** mm	**Ø4** mm	**Ø5** mm	**Ø6** mm	**Ø7** mm	**Ø8** mm	**Ø9** mm	**Ø10** mm	**Ø12** mm	**Ø14** mm	**Ø16** mm
P	Structural/free-cutting steels, Unalloyed heat-treatable-/ case hardened steels	< 22	< 220	330	0.0004	0.0008	0.0008	0.0010	0.0012	0.0012	0.0014	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	< 30	< 290	300	0.0004	0.0008	0.0008	0.0010	0.0012	0.0012	0.0014	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024
	Alloyed heat-treatable steels, heat-treatable steels, high speed steels	< 38	<350	260	0.0004	0.0008	0.0008	0.0010	0.0012	0.0012	0.0014	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024
M	Stainless steel sulfured, austenitic	< 30	< 290	215	0.0003	0.0006	0.0008	0.0010	0.0012	0.0012	0.0012	0.0014	0.0016	0.0016	0.0018	0.0020	0.0022
	Stainless and acid-resit. steel steels, martensitic	< 30	< 290	200	0.0003	0.0006	0.0008	0.0010	0.0012	0.0012	0.0012	0.0014	0.0016	0.0016	0.0018	0.0020	0.0022
	duplex and super duplex	< 40	< 375	180	0.0003	0.0006	0.0008	0.0010	0.0012	0.0012	0.0012	0.0014	0.0016	0.0016	0.0018	0.0020	0.0022
K	cast iron		< 300	450	0.0004	0.0008	0.0008	0.0010	0.0012	0.0012	0.0014	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024
	Spher. graph. iron and mall. cast iron		< 350	400	0.0004	0.0008	0.0008	0.0010	0.0012	0.0012	0.0014	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024
	ADI, GGV		< 350	330	0.0004	0.0008	0.0008	0.0010	0.0012	0.0012	0.0014	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024
N	Aluminium and wrought alloys		Wrought Aluminum 30 - 80 75 - 50	900	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026	0.0028	0.0030
	Aluminium- cast alloys	Silicon Content < 6% 6 - 12%		820	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026	0.0028	0.0030
	Magnesium alloys		< 150	650	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026	0.0028	0.0030
	Copper and copper alloys	long-chipping		450	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026	0.0028	0.0030
	Copper special alloys		< 410	430	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026	0.0028	0.0030
	Plastics [thermoplastics, duroplastics]	long-chipping		985	0.0004	0.0008	0.0010	0.0012	0.0014	0.0016	0.0018	0.0020	0.0022	0.0024	0.0026	0.0028	0.0030
S	Titanium and titanium alloys		< 350	180	0.0002	0.0003	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014	0.0014	0.0016	0.0018	0.0018	0.0020
	Nickel, cobalt, iron alloys		< 410	130	0.0002	0.0003	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014	0.0014	0.0016	0.0018	0.0018	0.0020
H	High tensile steels, hardened steels		< 55	165	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0010	0.0012	0.0012	0.0014	0.0016	0.0018
			< 62	--		--	--	--	--	--	--	--	--	--	--	--	--

Application recommendations drill/thread milling cutters
1.5xD, 2xD, 2.5xD

ISO	Material group	Hardness HRC	Hardness Brinnell	Cutting speed v_c (m/min)	Thread size / drill feed [IPR] / feed per tooth [IPT] 1.5xD, 2xD / 2.5xD							
					M3		M4		M5		M6	
					IPR in/rev	IPT in	IPR in/rev	IPT in	IPR in/rev	IPT in	IPR in/rev	IPT in
K	cast iron		< 300	360	0.0024	0.0004	0.0024	0.0006	0.0028	0.0008	0.0031	0.0010
	Spherical graphite iron and malleable cast iron		< 350	295	0.0024	0.0004	0.0024	0.0006	0.0028	0.0008	0.0031	0.0010
	ADI, GGV		< 350	--	--	--	--	--	--	--	--	--
N	Aluminium and wrought alloys		Wrought Aluminum	820	0.0024	0.0006	0.0028	0.0010	0.0031	0.0010	0.0039	0.0014
	Aluminium- cast alloys	Silicon Content < 6% 6 - 12%		755	0.0024	0.0006	0.0028	0.0010	0.0031	0.0010	0.0039	0.0014
	Magnesium alloys		< 150	590	0.0024	0.0006	0.0028	0.0010	0.0031	0.0010	0.0039	0.0014
	Copper and copper alloys	long-chipping		430	0.0020	0.0004	0.0024	0.0004	0.0028	0.0008	0.0031	0.0012
	Copper special alloys		< 410	--	--	--		--	--	--	--	--
	Plastics [thermoplastics, duroplastics]	long-chipping short-chipping		985	0.0028	0.0008	0.0031	0.0012	0.0035	0.0016	0.0039	0.0020

Type											DTMC	DTMC
[conventional milling]												
M8		M10		M12		M14		M16				
IPR in/rev	IPT in	IPR in/rev	IPT in	IPR in/rev	IPT in	IPR in/rev	IPT in	IPR in/rev	IPT in			
0.0039	0.0014	0.0047	0.0016	0.0051	0.0020	0.0059	0.0024	0.0071	0.0028		○	●
0.0039	0.0014	0.0047	0.0016	0.0051	0.0020	0.0059	0.0024	0.0071	0.0028		○	●
--	--	--	--	--	--	--	--	--	--			
0.0043	0.0016	0.0047	0.0022	0.0059	0.0026	0.0067	0.0028	0.0079	0.0033		●	○
0.0043	0.0016	0.0047	0.0022	0.0059	0.0026	0.0067	0.0028	0.0079	0.0033		●	●
0.0043	0.0016	0.0047	0.0022	0.0059	0.0026	0.0067	0.0028	0.0079	0.0033		●	○
0.0035	0.0016	0.0039	0.0020	0.0043	0.0024	0.0047	0.0024	0.0051	0.0028		○	●
--	--	--	--	--	--	--	--	--	--			
0.0043	0.0024	0.0047	0.0028	0.0051	0.0031	0.0055	0.0035	0.0059	0.0039		●	

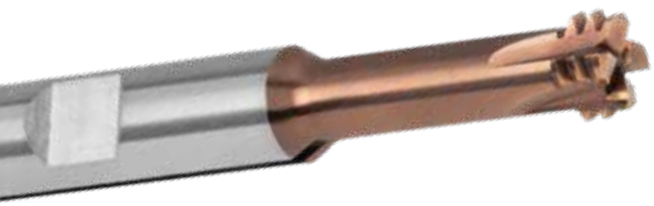
● Optimal
○ Secondary

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%!

General recommendation:
1.) From 2.5xD [thread depth] thread Ø should be programmed in 2 passes. [2/3-1/3 in conventional milling]
2.) Generally in stainless steel and in hard machining from ≥ HRC40 it is recommended thread Ø is programmed in 2 passes. [2/3-1/3 in conventional milling]

Application recommendations thread milling cutters
MTMH3-Z 2.5xD [Please note, M4 counter clockwise]

ISO		Hardness HRC	Hardness Brinell	Cutting speed SFM	Milling part diameter [d1] / feed per tooth [IPT] [conventional milling]										
					Ø1.4 mm	**Ø1.8** mm	**Ø2.4** mm	**Ø2.74** mm	**Ø3.1** mm	**Ø3.8** mm	**Ø4.6** mm	**Ø6.2** mm	**Ø7.5** mm	**Ø9** mm	**Ø11.5** mm
P	Structural/free-cutting steels, Unalloyed heat-treatable-/ case hardened steels	< 22	< 220	260	0.0003	0.0003	0.0005	0.0006	0.0007	0.0010	0.0011	0.0012	0.0014	0.0016	0.0019
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	< 30	< 290	230	0.0003	0.0003	0.0005	0.0006	0.0007	0.0010	0.0011	0.0012	0.0014	0.0016	0.0019
	Alloyed heat-treatable steels, heat-treatable steels, high speed steels	< 38	<350	230	0.0003	0.0003	0.0004	0.0004	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014	0.0017
M	Stainless steel sulfured, austenitic	< 30	< 290	180	0.0003	0.0003	0.0004	0.0004	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014	0.0017
	Stainless and acid-resit. steel steels, martensitic	< 30	< 290	165	0.0003	0.0003	0.0004	0.0004	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014	0.0017
	duplex and super duplex	< 40	< 375	165	0.0002	0.0002	0.0003	0.0003	0.0004	0.0006	0.0006	0.0007	0.0008	0.0010	0.0013
K	cast iron		< 300	260	0.0003	0.0003	0.0005	0.0006	0.0006	0.0008	0.0009	0.0012	0.0014	0.0016	0.0019
	Spher. graph. iron and mall. cast iron		< 350	245	0.0003	0.0003	0.0005	0.0006	0.0006	0.0008	0.0009	0.0012	0.0014	0.0016	0.0019
	ADI, GGV		< 350	215	0.0003	0.0003	0.0004	0.0005	0.0006	0.0007	0.0009	0.0011	0.0013	0.0015	0.0018
N	Aluminium and wrought alloys		Wrought Aluminum 30 - 80 75 - 50	--	--	--	--	--	--	--	--	--	--	--	--
	Aluminium- cast alloys	Silicon Content < 6% 6 - 12%		400	0.0003	0.0003	0.0004	0.0005	0.0006	0.0007	0.0009	0.0011	0.0013	0.0015	0.0018
	Magnesium alloys		< 150	--	--	--	--	--	--	--	--	--	--	--	--
	Copper and copper alloys	long-chipping		260	0.0003	0.0003	0.0005	0.0006	0.0006	0.0008	0.0009	0.0012	0.0014	0.0016	0.0019
	Copper special alloys		< 410	215	0.0003	0.0003	0.0004	0.0004	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014	0.0019
	Plastics [thermoplastics, duroplastics]	long-chipping		--	--	--	--	--	--	--	--	--	--	--	--
S	Titanium and titanium alloys		< 350	150	0.0003	0.0003	0.0004	0.0004	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014	0.0017
	Nickel, cobalt, iron alloys		< 410	150	0.0003	0.0003	0.0004	0.0004	0.0005	0.0006	0.0008	0.0010	0.0012	0.0014	0.0017
H	High tensile steels, hardened steels		< 55	130	0.0002	0.0002	0.0004	0.0004	0.0005	0.0006	0.0008	0.0010	0.0012	0.0013	0.0017
			< 62	100			0.0003	0.0003	0.0004	0.0005	0.0007	0.0008	0.0010	0.0012	0.0016



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