KOMET GROUP

THREADING SYSTEMS


KOMET®
GROUP
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• Thread Milling Tools
• Taps
• Roll Form Taps
• Modular Tool Systems
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TOOLS + IDEAS

Index

JEL

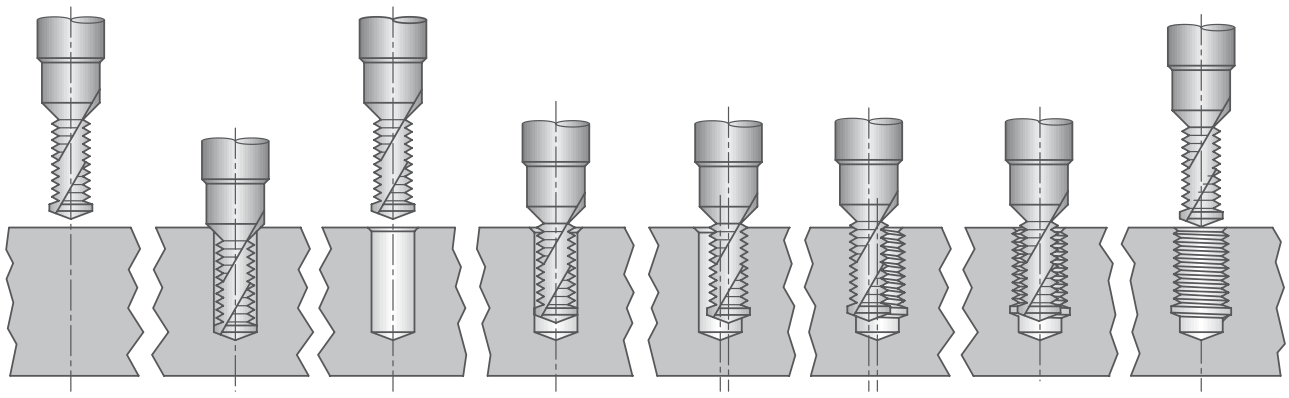
Methods for producing internal threads

Thread milling

- Chip producing method
- Thread making by helical interpolation within the pitch
- Same tool can be used for all threads with the same pitch starting from the nominal Ø
- Same tool can be used for different materials up to 45 HRC
- Lower torque than with tapping and roll form tapping
- Drill depth = thread depth if tool is not used for chamfering
- Machine spindle always running in the same direction – no reversing necessary
- High speed cutting (HSC) possible

Drill thread milling

- Chip producing method
- Complete thread is manufactured in a single pass – drilling, chamfering and thread milling
- One tool per dimension which can also be used for different materials
- Prerequisite: CNC machine or machining centre being capable to run helical interpolation



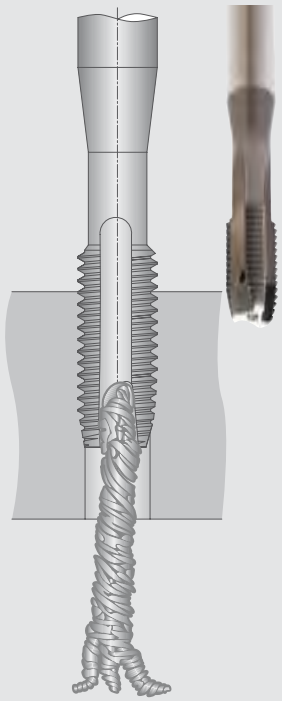
Drill thread milling: machining sequence

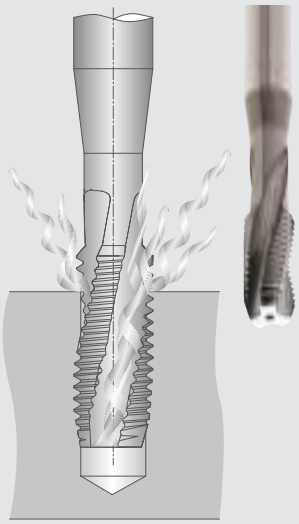
Methods for producing internal threads

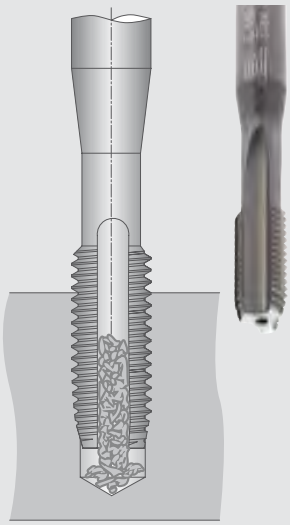
Tapping

- Chip producing method
- Thread making by rotation – pitch is on the tool
- Can be used on almost all machines
- 1 tool per dimension required

Through hole JEL tap Type: Dorex	Blind hole JEL tap Type: Sirex SR	Blind and through hole Short chipping materials JEL tap Type: GG

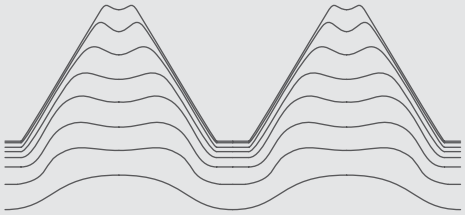






Roll form tapping

- Chip less method
- Thread making by forming – pitch is on the tool
- Suitable for materials with elongation of >5% and tensile strength of <1000 N/mm^2
- Tap drill Ø larger than with tapping
- Higher torque than tapping
- Generates forming gap at minor diameter



Thread forming – grain structure

Using the catalogue

How do I find the right tool ?

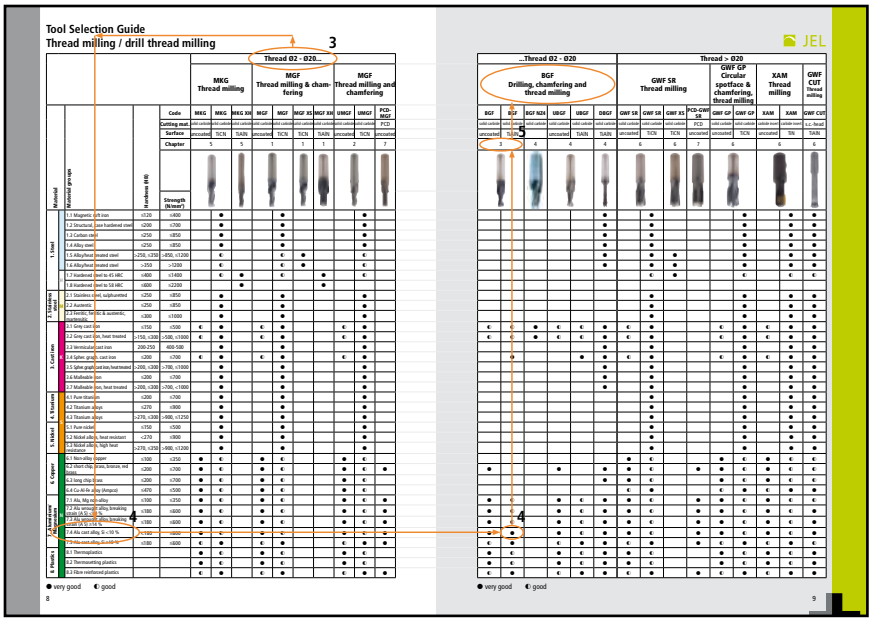
1. Machining task

Example: Thread M8
Drill depth: max. 19 mm
Thread depth: min. 15 mm
Material: G-AlSi9
Machining centre:
internal coolant available

2. Production method

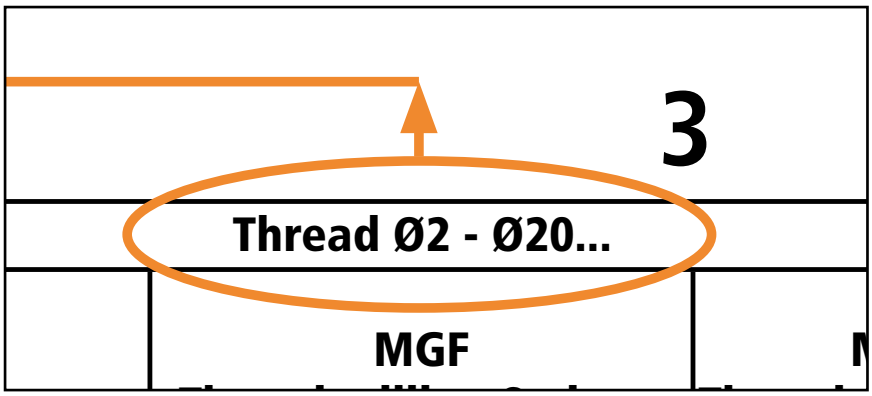
Go to the Tool Selection Guide on pages 8-9

Example:
Drill thread milling M8



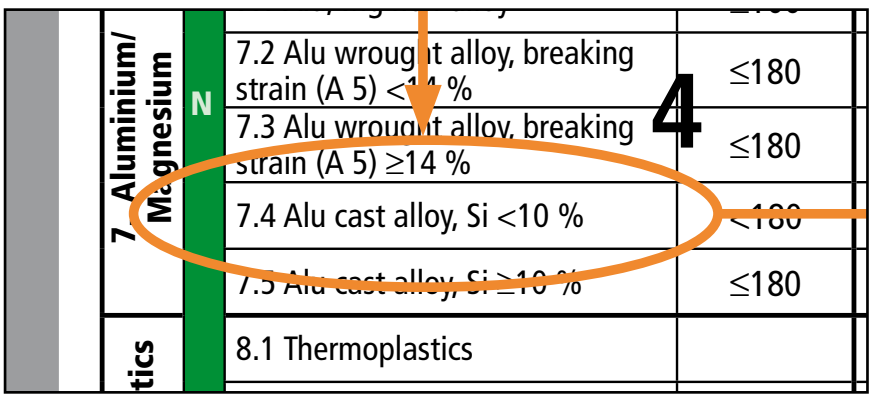
3. Select dimension range

Example: Ø 2-20



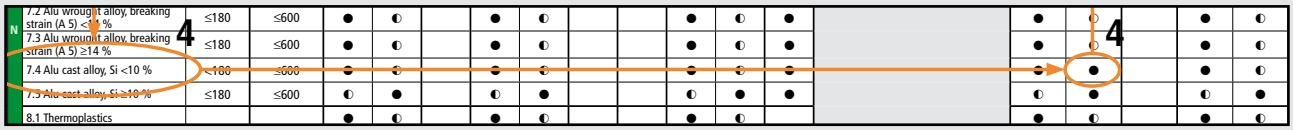
4. Specify material

Example:
Cast aluminium alloy Si<10%



Using the catalogue

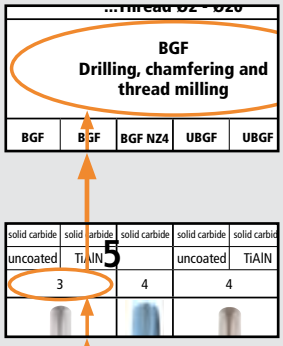
All tools with a full black circle or half black/half white circle against them in the same horizontal row are suitable for machining this material.



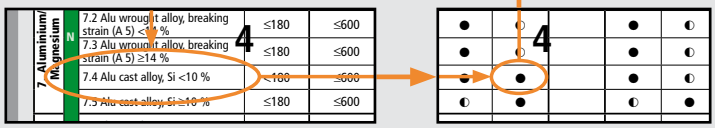
Select the suitable tool for the machining task required.

- thread milling only
- chamfering and thread milling

Example: drill thread milling



5. Go to the chapter indicated

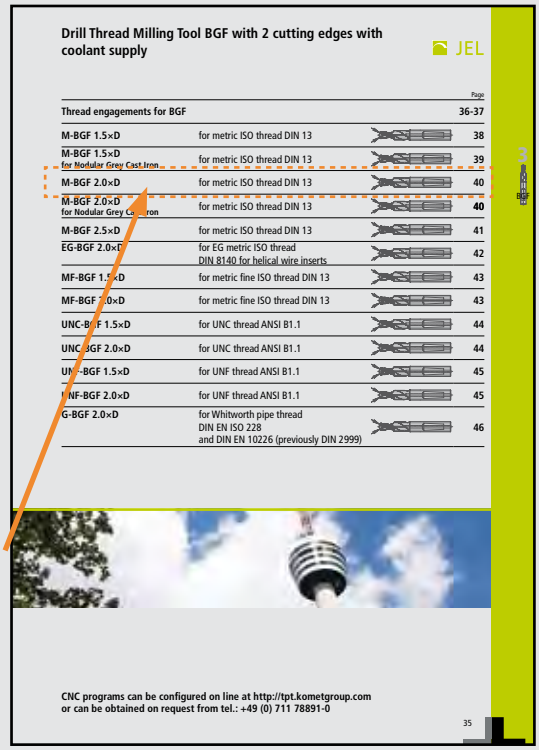


6. Specify the diameter to length ratio (thread depth/nominal dimension) – for

- drill thread milling
- thread milling Ø2-20 only

So using the example 15 mm/8 = approx. 2×D

Select the right tool as indicated in the chapter column, page 35
So for the example on page 40, Drill Thread Milling Tool 2.0×D with internal coolant supply for metric ISO thread.



7. Specify the shank form and select the required tool

M-BGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M4	0,70	49,0	9,4	8,9	36	0,7	3,3	6	4,5	4	3,24	2	**80941001000015**	**80935001000015**	**88941001000015**	**88935001000015**
M5	0,80	55,0	11,7	11,0	36	0,8	4,2	6	5,5	5	4,10	2	**80941001000017**	**80935001000017**	**88941001000017**	**88935001000017**
M6	1,00	62,0	14,5	13,7	36	1,0	5,0	8	6,6	6	4,85	2	**80941001000018**	**80935001000018**	**88941001000018**	**88935001000018**
M8	1,25	74,0	18,2	17,1	40	1,3	6,8	10	9,0	8	6,45	2	**80941001000020**	**80935001000020**	**88941001000020**	**88935001000020**

The actual dimensions for drill depth, thread engagement and full thread length generated at the part you will find at the table pages
Example: BGF M8 2.0×D, see page 36

Please see note on page 152

Tool Selection Guide
Thread milling / drill thread milling

Material		Material groups	Hardness (HB)	Code	Thread Ø2 - Ø20...									
					MKG Thread milling			MGF Thread milling & chamfering				MGF Thread milling and chamfering		
				Code	MKG	MKG	MKG XH	MGF	MGF	MGF XS	MGF XH	UMGF	UMGF	PCD-MGF
				Cutting mat.	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	PCD
				Surface	uncoated	TiCN	TiAlN	uncoated	TiCN	TiCN	TiAlN	uncoated	TiCN	uncoated
				Chapter	5		5	1		1	1	2		7
														
				Strength (N/mm²)										
1. Steel	P	1.1 Magnetic soft iron	≤120	≤400		●			●				●	
		1.2 Structural, case hardened steel	≤200	≤700		●			●				●	
		1.3 Carbon steel	≤250	≤850		●			●				●	
		1.4 Alloy steel	≤250	≤850		●			●				●	
		1.5 Alloy/heat treated steel	>250, ≤350	>850, ≤1200		◐			◐	●			◐	
		1.6 Alloy/heat treated steel	>350	>1200		◐			◐	●			◐	
	H	1.7 Hardened steel to 45 HRC	≤400	≤1400		◐	●		◐		●		◐	
		1.8 Hardened steel to 58 HRC	≤600	≤2200			●				●			
2. Stainless steel	M	2.1 Stainless steel, sulphuretted	≤250	≤850		●			●				●	
		2.2 Austentic	≤250	≤850		●			●				●	
		2.3 Ferritic, ferritic & austentic, martensitic	≤300	≤1000		●			●				●	
3. Cast iron	K	3.1 Grey cast iron	≤150	≤500	◐	●		◐	●			◐	●	
		3.2 Grey cast iron, heat treated	>150, ≤300	>500, ≤1000	◐	●		◐	●			◐	●	
		3.3 Vermicular cast iron	200-250	400-500		●			●				●	
		3.4 Spher. graph. cast iron	≤200	≤700	◐	●		◐	●			◐	●	
		3.5 Spher. graph. cast iron, heat treated	>200, ≤300	>700, ≤1000		●			●				●	
		3.6 Malleable iron	≤200	≤700		●			●				●	
		3.7 Malleable iron, heat treated	>200, ≤300	>700, <1000		●			●				●	
4. Titanium	S	4.1 Pure titanium	≤200	≤700		●			●				●	
		4.2 Titanium alloys	≤270	≤900		●			●				●	
		4.3 Titanium alloys	>270, ≤300	>900, ≤1250		●			●	●			●	
5. Nickel		5.1 Pure nickel	≤150	≤500		●			●				●	
		5.2 Nickel alloys, heat resistant	<270	≤900		●			●				●	
		5.3 Nickel alloys, high heat resistance	>270, ≤350	>900, ≤1200		●			●	●			●	
6. Copper	N	6.1 Non-alloy copper	≤100	≤350	●	◐		●	◐			●	◐	
		6.2 short chip, brass, bronze, red brass	≤200	≤700	●	◐		●	◐			●	◐	●
		6.3 long chip brass	≤200	≤700	●	◐		●	◐			●	◐	
		6.4 Cu-Al-Fe alloy (Ampco)	≤470	≤500	●	◐		●	◐			●	◐	
7. Aluminium/ Magnesium		7.1 Alu, Mg non-alloy	≤100	≤350	●	◐		●	◐			●	◐	●
		7.2 Alu wrought alloy, breaking strain (A 5) <14 %	≤180	≤600	●	◐		●	◐			●	◐	●
		7.3 Alu wrought alloy, breaking strain (A 5) ≥14 %	≤180	≤600	●	◐		●	◐			●	◐	●
		7.4 Alu cast alloy, Si <10 %	<180	≤600	●	◐		●	◐			●	◐	●
		7.5 Alu cast alloy, Si ≥10 %	≤180	≤600	◐	●		◐	●			◐	●	●
8. Plastics		8.1 Thermoplastics			●	◐		●	◐			●	◐	
		8.2 Thermosetting plastics			●	◐		●	◐			●	◐	
		8.3 Fibre reinforced plastics			◐	●		◐	●			◐	●	●

● very good ◐ good

...Thread Ø2 - Ø20						Thread > Ø20								
BGF Drilling, chamfering and thread milling						GWF SR Thread milling				GWF GP Circular spotface & chamfering, thread milling		XAM Thread milling		GWF CUT Thread milling
BGF	BGF	BGF NZ4	UBGF	UBGF	DBGF	GWF SR	GWF SR	GWF XS	PCD-GWF SR	GWF GP	GWF GP	XAM	XAM	GWF CUT
solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	PCD	solid carbide	solid carbide	carbide insert	carbide insert	s.c.-head
uncoated	TiAlN	AlCrN	uncoated	TiAlN	TiAlN	uncoated	TiCN	TiCN	uncoated	uncoated	TiCN	uncoated	TiN	TiAlN
3		4	4		4	6		6	7	6		6		6
														
					●		●				●		●	●
					●		●				●		●	●
					●		●				●		●	●
					●		●				●		●	●
					●		●	●			●		●	●
					●		●	●			●		●	●
							◐	●			◐		◐	◐
							●				●		●	●
							●				●		●	●
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◐	◐	●	◐	◐	●	◐	●			◐	●	◐	●	●
◐	◐	●	◐	◐	●	◐	●			◐	●	◐	●	●
					●		●				●		●	●
	●			●	●	◐	●			◐	●	◐	●	●
					●		●				●		●	●
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					●	●	◐			●	◐	●	◐	◐
						◐	●			◐	●	◐	●	●
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●	◐		●	◐	●	●	◐			●	◐	●	◐	●
◐	●		◐	●	●	◐	●		●	◐	●	◐	●	●

● very good ◐ good

Tool Selection Guide
Tapping

Material		Material groups	Hardness (HB)	Code	DOREX	DOREX VAV	DOREX TiN	DOREX TiCN	TINIB	FEDUB	GG	GG TiN	SIREX	SIREX SR	TAREX
				Cutting material	HSS-E	HSS-E	HSS-E	HSS-E	PM	PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
				Surface	uncoated	vaporized	TiN	TiCN	vaporized	vaporized	nitrided	TiN	uncoated	uncoated	uncoated
				Blind bore							●	●		●	●
				Through hole	●	●	●	●	●	●	●	●	●		
				Chapter	8				8		8		8	8	8
				Strength (N/mm²)											
1. Steel	P	1.1 Magnetic soft iron	≤120	≤400		●	●	●							
		1.2 Structural, case hardened steel	≤200	≤700	◐	●	●	●						◐	◐
		1.3 Carbon steel	≤250	≤850	◐	●	●	●						◐	◐
		1.4 Alloy steel	≤250	≤850		●	●	●							
		1.5 Alloy/heat treated steel	>250, ≤350	>850, ≤1200		◐	◐	◐							
		1.6 Alloy/heat treated steel	>350	>1200											
	H	1.7 Hardened steel to 45 HRC	≤400	≤1400											
		1.8 Hardened steel to 58 HRC	≤600	≤2200											
2. Stainless steel	M	2.1 Stainless steel, sulphuretted	≤250	≤850		●	●	●							
		2.2 Austentic	≤250	≤850		◐	◐	◐							
		2.3 Ferritic, ferritic & austentic, martensitic	≤300	≤1000						●					
3. Cast iron	K	3.1 Grey cast iron	≤150	≤500							●	●			
		3.2 Grey cast iron , heat treated	>150, ≤300	>500, ≤1000							◐	●			
		3.3 Vermicular cast iron	200-250	400-500											
		3.4 Spher. graph. cast iron	≤200	≤700	◐	●	●	●						◐	◐
		3.5 Spher. graph. cast iron, heat treated	>200, ≤300	>700, ≤1000		◐	◐	◐							
		3.6 Malleable iron	≤200	≤700	◐	●	●	●						◐	◐
		3.7 Malleable iron, heat treated	>200, ≤300	>700, <1000		◐	◐	◐							
4. Titanium	S	4.1 Pure titanium	≤200	≤700					●						
		4.2 Titanium alloys	≤270	≤900					●						
		4.3 Titanium alloys	>270, ≤300	>900, ≤1250					●						
5. Nickel		5.1 Pure nickel	≤150	≤500		●	●	●							◐
		5.2 Nickel alloys, heat resistant	<270	≤900						●					
		5.3 Nickel alloys, high heat resistance	>270, ≤350	>900, ≤1200						●					
6. Copper	N	6.1 Non-alloy copper	≤100	≤350	◐		◐	◐							◐
		6.2 short chip, brass, bronze, red brass	≤200	≤700							◐	●			
		6.3 long chip brass	≤200	≤700	◐		●	●							◐
		6.4 Cu-Al-Fe alloy (Ampco)	≤470	≤500											
7. Aluminium/ Magnesium		7.1 Alu, Mg non-alloy	≤100	≤350	◐		◐	◐						◐	◐
		7.2 Alu wrought alloy, breaking strain (A 5) <14 %	≤180	≤600	●		●	●						◐	●
		7.3 Alu wrought alloy, breaking strain (A 5) ≥14 %	≤180	≤600	◐		●	●						◐	◐
		7.4 Alu cast alloy, Si <10 %	<180	≤600	◐		●	●					◐		
		7.5 Alu cast alloy, Si ≥10 %	≤180	≤600	◐		◐	●					◐		
8. Plastics		8.1 Thermoplastics			◐		●	●							◐
		8.2 Thermosetting plastics									●	●			
		8.3 Fibre reinforced plastics									●	●			

● very good ◐ good

TAREX VAV	TAREX TiN	TAREX TiCN	TAREX OT TiN	TAREX AL	TINIC	FEDUC	SIREX SR IK	SIREX SR IK TiN	SIREX SR IK TiCN	TAREX IK	TAREX IK TiN	GG IK	GG IK TiN	SIREX	SIREX SR	GG	DOREX	SIREX XH
HSS-E	HSS-E	HSS-E	PM	HSS-E	PM	PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide
vaporized	TiN	TiCN	TiN	uncoated	vaporized	vaporized	uncoated	TiN	TiCN	uncoated	TiN	nitrided	TiN	uncoated	uncoated	uncoated	uncoated	TiAlN
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
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8				8	8		8			8		8		8	8	8	8	8
																		
●	●	●									●							
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◐	◐	◐	●					◐	◐		◐				◐		◐	
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							◐	●	●	◐	◐			●	◐		◐	
	◐	◐								◐	◐				●		●	
														●	●		●	
														●	●		●	

● very good ◐ good

Tool Selection Guide
Thread forming

Material		Material groups	Hardness (HB)	Code	HSS-E Tools			
					MOREX TiN	MOREX IK TiN	MOREX N TiN	MOREX N IKS TiN
				Cutting material	HSS-E	HSS-E	HSS-E	HSS-E
				Surface	TiN	TiN	TiN	TiN
				Blind bore	●	●	●	●
				Through hole			●	●
				Chapter	9	9	9	9
								
				Strength (N/mm²)				
1. Steel	P	1.1 Magnetic soft iron	≤120	≤400	●	●	●	●
		1.2 Structural, case hardened steel	≤200	≤700	●	●	●	●
		1.3 Carbon steel	≤250	≤850	●	●	●	●
		1.4 Alloy steel	≤250	≤850	●	●	●	●
		1.5 Alloy/heat treated steel	>250, ≤350	>850, ≤1200	●	●	●	●
		1.6 Alloy/heat treated steel	>350	>1200	◐	◐	◐	◐
	H	1.7 Hardened steel to 45 HRC	≤400	≤1400				
		1.8 Hardened steel to 58 HRC	≤600	≤2200				
2. Stainless steel	M	2.1 Stainless steel, sulphuretted	≤250	≤850	●	●	●	●
		2.2 Austentic	≤250	≤850	●	●	●	●
		2.3 Ferritic, ferritic & austentic, martensitic	≤300	≤1000	●	●	●	●
3. Cast iron	K	3.1 Grey cast iron	≤150	≤500				
		3.2 Grey cast iron , heat treated	>150, ≤300	>500, ≤1000				
		3.3 Vermicular cast iron	200-250	400-500				
		3.4 Spher. graph. cast iron	≤200	≤700	●	●	●	●
		3.5 Spher. graph. cast iron, heat treated	>200, ≤300	>700, ≤1000	●	●	●	●
		3.6 Malleable iron	≤200	≤700				
		3.7 Malleable iron, heat treated	>200, ≤300	>700, <1000				
4. Titanium	S	4.1 Pure titanium	≤200	≤700	◐	◐	◐	◐
		4.2 Titanium alloys	≤270	≤900	●	●	●	●
		4.3 Titanium alloys	>270, ≤300	>900, ≤1250	◐	◐	◐	◐
5. Nickel		5.1 Pure nickel	≤150	≤500	●	●	●	●
		5.2 Nickel alloys, heat resistant	<270	≤900	●	●	●	●
		5.3 Nickel alloys, high heat resistance	>270, ≤350	>900, ≤1200	◐	◐	◐	◐
6. Copper	N	6.1 Non-alloy copper	≤100	≤350	◐	◐	◐	◐
		6.2 short chip, brass, bronze, red brass	≤200	≤700				
		6.3 long chip brass	≤200	≤700	◐	◐	◐	◐
		6.4 Cu-Al-Fe alloy (Ampco)	≤470	≤500				
7. Aluminium/ Magnesium		7.1 Alu, Mg non-alloy	≤100	≤350	●	●	●	●
		7.2 Alu wrought alloy, breaking strain (A 5) <14 %	≤180	≤600	◐	◐	◐	◐
		7.3 Alu wrought alloy, breaking strain (A 5) ≥14 %	≤180	≤600	◐	◐	◐	◐
		7.4 Alu cast alloy, Si <10 %	<180	≤600	◐	◐	◐	◐
		7.5 Alu cast alloy, Si ≥10 %	≤180	≤600				
8. Plastics		8.1 Thermoplastics						
		8.2 Thermosetting plastics						
		8.3 Fibre reinforced plastics						

● very good ◐ good

Solid carbide tools						HSS-E with carbide strips			
MOREX IK	**MOREX IK TiN**	**MOREX N IK**	**MOREX N IK TiN**	**MOREX N IKS**	**MOREX N IKS TiN**	**MOREX HML IK**	**MOREX N HML IK**	**MOREX HML IK TiN**	**MOREX N HML IKS TiN**
solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	solid carbide	carbide strips	carbide strips	carbide strips	carbide strips
uncoated	TiN	uncoated	TiN	uncoated	TiN	uncoated	uncoated	TiN	TiN
●	●	●	●	●	●	●	●	●	●
		●	●	●	●		●		●
9		9		9	9	9			
									
	●		●		●			●	●
	●		●		●			●	●
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	●		●		●			●	●
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●	●	●	●	●	●	●	●	●	●
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●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●

● very good ◐ good

MGF Thread Milling Tools

Chamfering and thread milling right from M2

Spiral fluted solid carbide tools with profile correction and rear chamfer.

Diameter range 2-20 mm

This offers the following main advantages compared to the conventional methods of tapping and roll form tapping:

- One and the same tool for different tolerances
- One and the same tool for different diameters
  >Nominal Ø with same pitch

- One and the same tool for blind and through holes
- One and the same tool for different materials
- Exact and repeatable chamfer and thread depth
- No chip root remaining in the thread
- Step drill can be replaced with standard twist drill
- High speed cutting (HSC) possible

MGF Thread Milling Tools

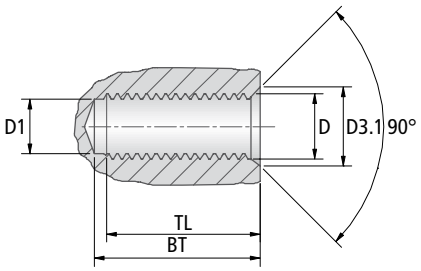
JEL

CNC programs can be configured online at http://tpt.kometgroup.com or can be obtained on request from tel.: +49 (0) 711 78891-0

Thread engagements for MGF

For metric ISO thread DIN 13, for metric fine ISO thread DIN 13 and for UNC thread ANSI B1.1.

BT = Min. drill depth
TL = Full thread length



M	1,5×D				2,0×D				2,5×D			
	D1	BT	D3.1	TL	D1	BT	D3.1	TL	D1	BT	D3.1	TL
M2	1,60	3,36	2,30	3,06	1,60	4,56	2,30	4,26	1,60			
M3	2,50	5,16	3,30	4,77	2,50	6,66	3,30	6,27	2,50			
M4	3,30	6,48	4,30	5,91	3,30	8,58	4,30	8,01	3,30	10,68	4,30	10,11
M5	4,20	8,22	5,30	7,52	4,20	10,60	5,30	9,92	4,20	13,00	5,30	12,32
M6	5,00	10,21	6,30	9,36	5,00	13,21	6,30	12,36	5,00	16,21	6,30	15,36
M8	6,75	14,01	8,30	12,89	6,75	17,76	8,30	16,64	6,75	21,51	8,30	20,39
M10	8,50	16,81	10,30	15,42	8,50	21,31	10,30	19,92	8,50	27,31	10,30	25,92
M12	10,30	19,65	12,30	17,95	10,30	26,60	12,30	24,96	10,30	31,85	12,30	30,21
M14	12,00	24,40	14,30	22,50	12,00	30,40	14,30	28,50	12,00	38,40	14,30	36,50
M16	14,00	26,42	16,30	24,47	14,00	34,42	16,30	32,47	14,00	42,42	16,30	40,47
M20	17,50	35,55	20,30	33,00	17,50	45,55	20,30	43,00	17,50	53,05	20,30	50,50

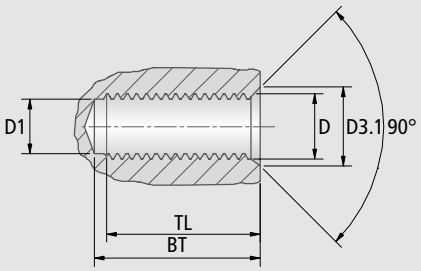
MF	1,5×D				2,0×D				2,5×D			
	D1	BT	D3.1	TL	D1	BT	D3.1	TL	D1	BT	D3.1	TL
M4×0,5	3,50	6,73	4,30	6,21	3,50	8,73	4,30	8,21	3,50	10,73	4,30	10,21
M5×0,5	4,50	8,30	5,30	7,70	4,50	10,80	5,30	10,20	4,50	13,30	5,30	12,70
M6×0,75	5,25	10,03	6,30	9,20	5,25	13,03	6,30	12,20	5,25	16,03	6,30	15,20
M8×1	7,00	13,34	8,30	12,26	7,00	17,34	8,30	16,26	7,00	21,34	8,30	20,26
M10×1	9,00	16,46	10,30	15,17	9,00	21,46	10,30	20,17	9,00	26,46	10,30	25,17
M12×1,5	10,50	19,92	12,30	18,33	10,50	25,92	12,30	24,33	10,50	31,92	12,30	30,33
M12×1	11,00	19,57	12,30	18,08	11,00	25,57	12,30	24,08	11,00	31,57	12,30	30,08
M14×1,5	12,50	23,05	14,30	21,23	12,50	30,55	14,30	28,73	12,50	38,05	14,30	36,23
M16×1,5	14,50	26,07	16,30	24,21	14,50	33,57	16,30	31,71	14,50	42,57	16,30	40,70

UNC	1,5×D				2,0×D				2,5×D			
	D1	BT	D3.1	TL	D1	BT	D3.1	TL	D1	BT	D3.1	TL
1/4-20 UNC	5,08	11,65	6,65	10,62	5,08	15,46	6,65	14,40	5,08	16,73	6,65	15,67
5/16-18 UNC	6,53	12,93	8,24	11,80	6,53	17,14	8,24	16,01	6,53	21,37	8,24	20,20
3/8-16 UNC	7,94	16,20	9,83	14,81	7,94	20,92	9,83	19,53	7,94	25,68	9,83	24,30
1/2-13 UNC	10,75	21,97	13,00	20,00	10,75	27,83	13,00	25,81	10,75	33,70	13,00	31,68

Thread engagements for MGF

For UNF thread ANSI B1.1, for NPT/NPTF thread ANSI B2.1 and for Whitworth pipe thread DIN EN ISO 228 and DIN EN 10226 (previously DIN 2999)

BT = Min. drill depth
TL = Full thread length



UNF	1,5×D				2,0×D				2,5×D			
	D1	BT	D3.1	TL	D1	BT	D3.1	TL	D1	BT	D3.1	TL
1/4-28 UNF	5,44	11,20	6,65	10,20	5,44	14,84	6,65	13,85	5,44	17,56	6,65	16,57
5/16-24 UNF	6,88	13,00	8,24	11,90	6,88	17,23	8,24	16,18	6,88	21,47	8,24	20,40
3/8-24 UNF	8,47	15,16	9,83	14,09	8,47	20,42	9,83	19,35	8,47	25,70	9,83	24,60
7/16-20 UNF	9,84	18,05	11,41	16,90	9,84	23,13	11,41	21,99	9,84	29,48	11,41	28,30
1/2-20 UNF	11,43	21,01	13,00	19,10	11,43	27,36	13,00	25,50	11,43	33,71	13,00	31,80

NPT	Standard length			
	D1	BT	D3.1	TL
1/16-27 NPT	6,15	11,36	8,70	9,00
1/8-27 NPT	8,43	11,36	11,10	9,00
1/4-18 NPT	11,13	16,77	14,50	13,50
3/8-18 NPT	14,27	16,77	17,90	13,50

NPTF	Standard length			
	D1	BT	D3.1	TL
1/16-27 NPTF	6,10	11,36	8,70	9,00
1/8-27 NPTF	8,40	11,36	11,10	9,00
1/4-18 NPTF	11,00	16,77	14,50	13,50
3/8-18 NPTF	14,50	16,77	17,90	13,50

G	1,5×D				2,0×D				2,5×D			
	D1	BT	D3.1	TL	D1	BT	D3.1	TL	D1	BT	D3.1	TL
G1/8-28	8,82	15,81	10,03	14,67	8,82	21,25	10,03	20,11	8,82	25,84	10,03	24,70
G1/4-19	11,82	21,74	13,46	20,37	11,82	28,43	13,46	27,06	11,82	35,18	13,46	33,80
G3/8-19	15,32	27,22	16,96	25,60	15,32	35,24	16,96	33,62	15,32	43,26	16,96	41,60

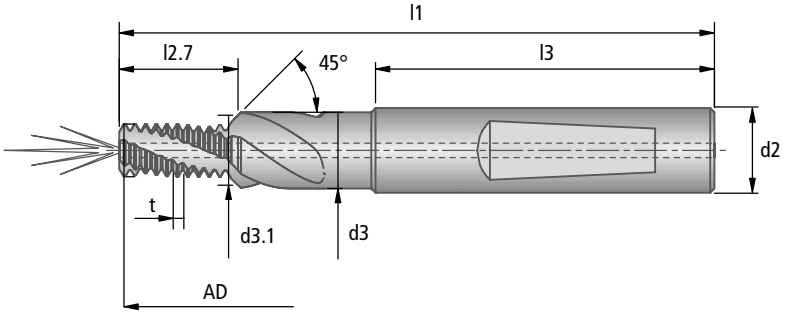
Please see note on page 152

M Thread Milling Tool MGF

with rear chamfer, 1.5×D; 2.0×D and 2.5×D

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide



M-MGF 1,5×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M2	0,40	1,60	47,8	3,4	36	6	2,5	2,3	1,56	2	80981001000008		88981001000008	
M3	0,50	2,50	47,5	5,2	36	6	3,4	3,3	2,44	3	80981001000013		88981001000013	
M4	0,70	3,30	46,9	6,5	36	6	4,5	4,3	3,14	3	80981001000015	80973001000015	88981001000015	88973001000015
M5	0,80	4,20	52,6	8,2	36	6	5,5	5,3	3,95	3	80981001000017	80973001000017	88981001000017	88973001000017
M6	1,00	5,00	59,0	10,2	36	8	6,6	6,3	4,68	3	80981001000018	80973001000018	88981001000018	88973001000018
M8	1,25	6,75	70,3	14,0	40	10	9,0	8,3	6,22	3	80981001000020	80973001000020	88981001000020	88973001000020
M10	1,50	8,50	74,5	16,8	45	12	11,0	10,3	7,79	3	80981001000022	80973001000022	88981001000022	88973001000022
M12	1,75	10,25	82,0	19,6	45	14	13,5	12,3	9,38	3	80981001000024	80973001000024	88981001000024	88973001000024
M14	2,00	12,00	96,0	24,4	48	16	15,5	14,3	10,92	4	80981001000025	80973001000025	88981001000025	88973001000025
M16	2,00	14,00	94,0	26,4	48	18	17,5	16,3	12,83	4	80981001000026	80973001000026	88981001000026	88973001000026
M20	2,50	17,50	117,0	35,55	56	25	25,0	20,3	15,83	4	80981001000028	80973001000028	88981001000028	88973001000028

M-MGF 2,0×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M2	0,40	1,60	49,0	4,6	36	6	2,5	2,3	1,56	2	80970001000008		88970001000008	
M3	0,50	2,50	49,0	6,7	36	6	3,4	3,3	2,44	3	80970001000013		88970001000013	
M4	0,70	3,30	49,0	8,6	36	6	4,5	4,3	3,14	3	80970001000015	80992001000015	88970001000015	88992001000015
M5	0,80	4,20	55,0	10,6	36	6	5,5	5,3	3,95	3	80970001000017	80992001000017	88970001000017	88992001000017
M6	1,00	5,00	62,0	13,2	36	8	6,6	6,3	4,68	3	80970001000018	80992001000018	88970001000018	88992001000018
M8	1,25	6,75	74,0	17,8	40	10	9,0	8,3	6,22	3	80970001000020	80992001000020	88970001000020	88992001000020
M10	1,50	8,50	79,0	21,3	45	12	11,0	10,3	7,79	3	80970001000022	80992001000022	88970001000022	88992001000022
M12	1,75	10,25	89,0	26,6	45	14	13,5	12,3	9,38	3	80970001000024	80992001000024	88970001000024	88992001000024
M14	2,00	12,00	102,0	30,4	48	16	15,5	14,3	10,92	4	80970001000025	80992001000025	88970001000025	88992001000025
M16	2,00	14,00	102,0	34,4	48	18	17,5	16,3	12,83	4	80970001000026	80992001000026	88970001000026	88992001000026
M20	2,50	17,50	127,0	45,55	56	25	25,0	20,3	15,83	4	80970001000028	80992001000028	88970001000028	88992001000028

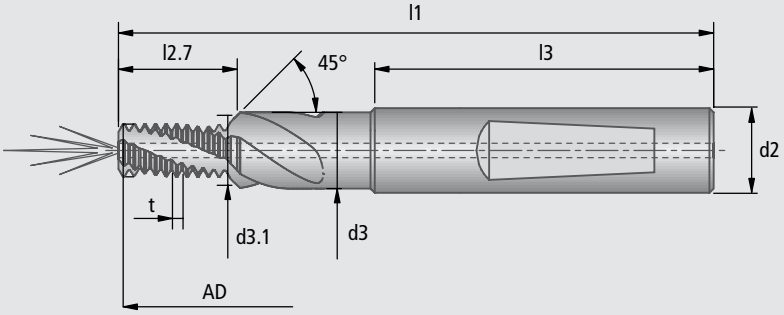
M-MGF 2,5×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M4	0,70	3,30	49,0	10,7	36	6	4,5	4,3	3,14	3				
M5	0,80	4,20	55,0	13,0	36	6	5,5	5,3	3,95	3	80990001000017		88990001000017	
M6	1,00	5,00	62,0	16,2	36	8	6,6	6,3	4,68	3	80990001000018	80995001000018	88990001000018	88995001000018
M8	1,25	6,75	74,0	21,5	40	10	9,0	8,3	6,22	3	80990001000020	80995001000020	88990001000020	88995001000020
M10	1,50	8,50	79,0	27,3	45	12	11,0	10,3	7,79	3	80990001000022	80995001000022	88990001000022	88995001000022
M12	1,75	10,25	89,0	31,9	45	14	13,5	12,3	9,38	3	80990001000024	80995001000024	88990001000024	88995001000024
M14	2,00	12,00	102,0	38,4	48	16	15,5	14,3	10,92	4				
M16	2,00	14,00	102,0	42,4	48	18	17,5	16,3	12,83	4				

MF Thread Milling Tool MGF

with rear chamfer, 1.5×D - 2.0×D

For metric fine ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide



MF-MGF 1,5×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M4×0,5	0,50	3,50	47,0	6,7	36	6	4,5	4,3	3,14	3				
M5×0,5	0,50	4,50	52,5	8,3	36	6	5,5	5,3	3,95	3				
M6×0,75	0,75	5,25	59,0	10,0	36	8	6,6	6,3	4,68	3				
M8×1	1,00	7,00	70,0	13,3	40	10	9,0	8,3	6,22	3	**80981002000070**	**80973002000070**	**88981002000070**	**88973002000070**
M10×1	1,00	9,00	74,0	16,5	45	12	11,0	10,3	7,79	3	**80981002000094**	**80973002000094**	**88981002000094**	**88973002000094**
M12×1	1,00	11,00	83,0	19,6	45	14	13,5	12,3	9,38	3	**80981002000111**		**88981002000111**	
M12×1,5	1,50	10,50	83,0	19,9	45	14	13,5	12,3	9,38	3	**80981002000113**	**80973002000113**	**88981002000113**	**88973002000113**
M14×1,5	1,50	12,50	94,5	23,1	48	16	15,5	14,3	10,92	4	**80981002000131**	**80973002000131**	**88981002000131**	**88973002000131**
M16×1,5	1,50	14,50	94,5	26,1	48	18	17,5	16,3	12,82	4	**80981002000147**	**80973002000147**	**88981002000147**	**88973002000147**

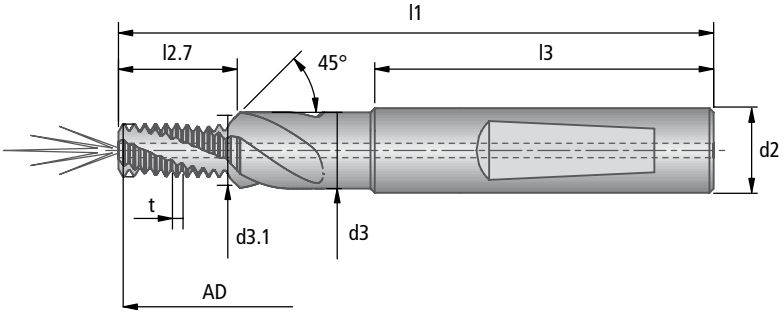
MF-MGF 2,0×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M4×0,5	0,50	3,50	49,0	8,7	36	6	4,5	4,3	3,14	3				
M5×0,5	0,50	4,50	55,0	10,8	36	6	5,5	5,3	3,95	3	**80970002000037**		**88970002000037**	
M6×0,75	0,75	5,25	62,0	13,0	36	8	6,6	6,3	4,68	3	**80970002000048**		**88970002000048**	
M8×1	1,00	7,00	74,0	17,3	40	10	9,0	8,3	6,22	3	**80970002000070**	**80992002000070**	**88970002000070**	**88992002000070**
M10×1	1,00	9,00	79,0	21,5	45	12	11,0	10,3	7,79	3	**80970002000094**	**80992002000094**	**88970002000094**	**88992002000094**
M12×1	1,00	11,00	89,0	25,6	45	14	13,5	12,3	9,38	3	**80970002000111**		**88970002000111**	
M12×1,5	1,50	10,50	89,0	25,9	45	14	13,5	12,3	9,38	3	**80970002000113**	**80992002000113**	**88970002000113**	**88992002000113**
M14×1,5	1,50	12,50	102,0	30,6	48	16	15,5	14,3	10,92	4	**80970002000131**	**80992002000131**	**88970002000131**	**88992002000131**
M16×1,5	1,50	14,50	102,0	33,6	48	18	17,5	16,3	12,82	4	**80970002000147**	**80992002000147**	**88970002000147**	**88992002000147**

UNC Thread Milling Tool MGF

with rear chamfer, 1.5×D - 2.0×D

For UNC thread ANSI B1.1
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide



UNC-MGF 1,5×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
1/4-20 UNC	1,270	5,08	58,2	11,65	36	8	7,8	6,7	4,70	3	80981010000011	80973010000011	88981010000011	88973010000011
5/16-18 UNC	1,411	6,53	69,8	12,90	40	10	9,0	8,2	6,22	3	80981010000012	80973010000012	88981010000012	88973010000012
3/8-16 UNC	1,588	7,94	74,2	16,20	45	12	11,0	9,8	7,34	3	80981010000013	80973010000013	88981010000013	88973010000013
1/2-13 UNC	1,954	10,75	83,1	22,00	45	14	13,5	13,0	9,38	3	80981010000015	80973010000015	88981010000015	88973010000015

UNC-MGF 2,0×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
1/4-20 UNC	1,270	5,08	62,0	15,46	36	8	7,8	6,7	4,70	3	80970010000011	80992010000011	88970010000011	88992010000011
5/16-18 UNC	1,411	6,53	74,0	17,10	40	10	9,0	8,2	6,22	3	80970010000012	80992010000012	88970010000012	88992010000012
3/8-16 UNC	1,588	7,94	79,0	20,90	45	12	11,0	9,8	7,34	3	80970010000013	80992010000013	88970010000013	88992010000013
1/2-13 UNC	1,954	10,75	89,0	27,80	45	14	13,5	13,0	9,38	3	80970010000015	80992010000015	88970010000015	88992010000015

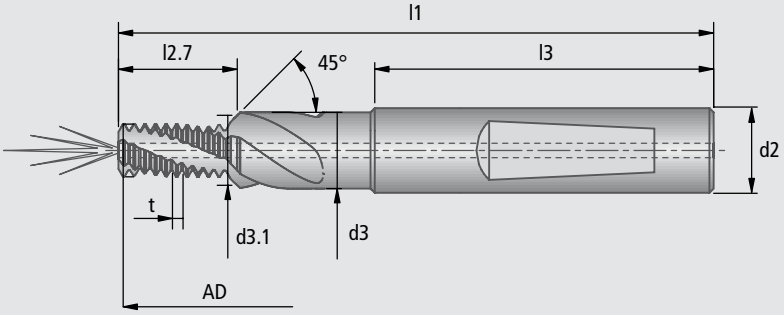
UNF Thread Milling Tool MGF

with rear chamfer, 1.5×D - 2.0×D

JEL

For UNF thread ANSI B1.1
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide



UNF-MGF 1,5×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
1/4-28 UNF	0,907	5,44	58,4	11,2	36	8	7,8	6,65	4,70	3	80981011000011	80973011000011	88981011000011	88973011000011
5/16-24 UNF	1,058	6,88	69,8	13,0	40	10	9,0	8,24	6,22	3	80981011000012	80973011000012	88981011000012	88973011000012
3/8-24 UNF	1,058	8,47	73,7	15,1	45	12	11,0	9,83	7,79	3	80981011000013	80973011000013	88981011000013	88973011000013
7/16-20 UNF	1,270	9,84	82,9	18,05	45	14	13,5	11,41	9,32	3	80981011000014	80973011000014	88981011000014	88973011000014
1/2-20 UNF	1,270	11,43	82,7	21,0	45	14	13,5	13,00	9,38	3	80981011000015	80973011000015	88981011000015	88973011000015

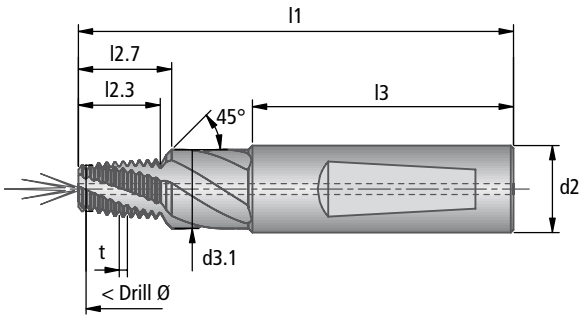
UNF-MGF 2,0×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
1/4-28 UNF	0,907	5,44	62,0	14,8	36	8	7,8	6,65	4,70	3	80970011000011	80992011000011	88970011000011	88992011000011
5/16-24 UNF	1,058	6,88	74,0	17,2	40	10	9,0	8,24	6,22	3	80970011000012	80992011000012	88970011000012	88992011000012
3/8-24 UNF	1,058	8,47	79,0	20,4	45	12	11,0	9,83	7,79	3	80970011000013	80992011000013	88970011000013	88992011000013
7/16-20 UNF	1,270	9,84	88,0	23,1	45	14	13,5	11,41	9,32	3	80970011000014	80992011000014	88970011000014	88992011000014
1/2-20 UNF	1,270	11,43	89,0	27,4	45	14	13,5	13,00	9,38	3	80970011000015	80992011000015	88970011000015	88992011000015

NPT/NPTF Thread Milling Tool MGF

with rear chamfer

For NPT-/NPTF thread ANSI B2.1
Thread reach in line with requirements under standard
Shank Ø DIN 6535 Form HE/HA

From shank Ø 12 mm with internal coolant supply
Cutting material: solid carbide



NPT-MGF										uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.3	l2.7	l3	d2	d3.1	Z	Order No.	Order No.	Order No.	Order No.
1/16-27 NPT	0,941	6,15	64,0	9,7	11,36	40	10	8,7	3	**80970016000001**		**88970016000001**	
1/8-27 NPT	0,941	8,50	70,0	9,7	11,36	45	12	11,1	3	**80970016000002**	**80973016000002**	**88970016000002**	**88973016000002**
1/4-18 NPT	1,411	11,0	80,0	14,81	16,77	48	16	14,5	4	**80970016000003**	**80973016000003**	**88970016000003**	**88973016000003**
3/8-18 NPT	1,411	14,5	81,0	14,81	16,77	48	18	17,9	4	**80970016000004**	**80973016000004**	**88970016000004**	**88973016000004**

For threads ½" – 14 NPT and bigger, use JEL "TOMILL GS" Thread Milling Tool

NPTF-MGF										uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.3	l2.7	l3	d2	d3.1	Z	Order No.	Order No.	Order No.	Order No.
1/16-27 NPTF	0,941	6,10	64,0	9,7	11,36	40	10	8,7	3				
1/8-27 NPTF	0,941	8,45	70,0	9,7	11,36	45	12	11,1	3	**80970017000002**	**80973017000002**	**88970017000002**	**88973017000002**
1/4-18 NPTF	1,411	10,90	80,0	14,81	16,77	48	16	14,5	4	**80970017000003**	**80973017000003**	**88970017000003**	**88973017000003**
3/8-18 NPTF	1,411	14,30	81,0	14,81	16,77	48	18	17,9	4	**80970017000004**	**80973017000004**	**88970017000004**	**88973017000004**

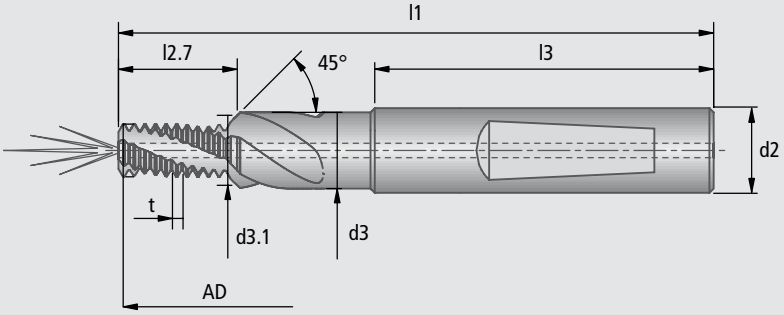
For threads ½" – 14 NPTF and bigger, use JEL "TOMILL GS" Thread Milling Tool

G Thread Milling Tool MGF

with rear chamfer, 1.5×D - 2.0×D

For Whitworth pipe thread DIN EN ISO 228 and DIN EN 10226 (previously DIN 2999)
Shank Ø DIN 6535 Form HE/HA

From shank Ø 12 mm with internal coolant supply
Cutting material: solid carbide



G-MGF 1,5×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
G1/8-28	0,907	8,82	73,6	15,8	45	12	11,0	10,0	7,79	3	80981025000001	80973025000001	88981025000001	88973025000001
G1/4-19	1,337	11,82	94,0	21,7	48	16	15,5	13,5	10,92	4	80981025000002	80973025000002	88981025000002	88973025000002
G3/8-19	1,337	15,32	94,0	27,2	50	20	17,5	17,0	13,92	4	80981025000003		88981025000003	

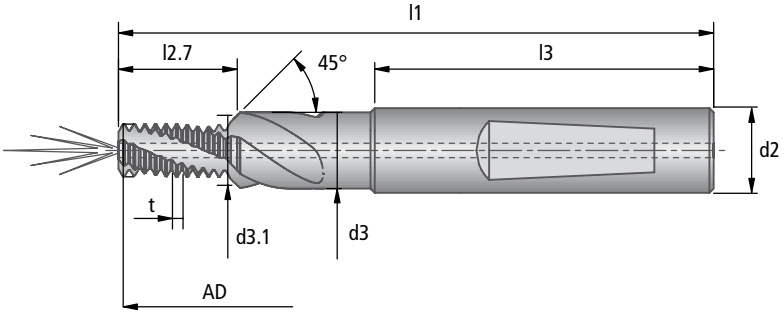
G-MGF 2,0×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
G1/8-28	0,907	8,82	79,0	21,2	45	12	11,0	10,0	7,79	3	80970025000001	80992025000001	88970025000001	88992025000001
G1/4-19	1,337	11,82	100,5	28,4	48	16	15,5	13,5	10,92	4	80970025000002	80992025000002	88970025000002	88992025000002
G3/8-19	1,337	15,32	102,0	35,2	50	20	17,5	17,0	13,92	4	80970025000003		88970025000003	

M Thread Milling Tool MGF XS

with rear chamfer, 1.5×D - 2.0×D

For metric ISO thread DIN 13
For machining steel ≥900 N/mm² tensile strength
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide



M-MGF XS 1,5×D											TiCN - HE	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.
M4	0,70	3,30	46,9	6,5	36	6	4,5	4,3	3,14	3	**80273001000015**	**88273001000015**
M5	0,80	4,20	52,6	8,2	36	6	5,5	5,3	3,95	3	**80273001000017**	**88273001000017**
M6	1,00	5,00	59,0	10,2	36	8	6,6	6,3	4,68	3	**80273001000018**	**88273001000018**
M8	1,25	6,75	70,3	14,0	40	10	9,0	8,3	6,22	3	**80273001000020**	**88273001000020**
M10	1,50	8,50	74,5	16,8	45	12	11,0	10,3	7,79	3	**80273001000022**	**88273001000022**
M12	1,75	10,25	82,0	19,6	45	14	13,5	12,3	9,38	3	**80273001000024**	**88273001000024**
M14	2,00	12,00	96,0	24,4	48	16	15,5	14,3	10,92	4	**80273001000025**	**88273001000025**
M16	2,00	14,00	94,0	26,4	48	18	17,5	16,3	12,83	4	**80273001000026**	**88273001000026**
M20	2,50	17,50	117,0	35,55	56	25	25,0	20,3	15,83	4	**80273001000028**	**88273001000028**

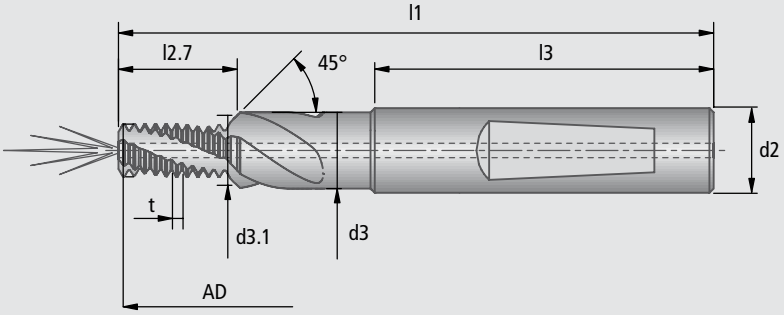
M-MGF XS 2,0×D											TiCN - HE	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.
M4	0,70	3,30	49,0	8,6	36	6	4,5	4,3	3,14	3	**80292001000015**	**88292001000015**
M5	0,80	4,20	55,0	10,6	36	6	5,5	5,3	3,95	3	**80292001000017**	**88292001000017**
M6	1,00	5,00	62,0	13,2	36	8	6,6	6,3	4,68	3	**80292001000018**	**88292001000018**
M8	1,25	6,75	74,0	17,8	40	10	9,0	8,3	6,22	3	**80292001000020**	**88292001000020**
M10	1,50	8,50	79,0	21,3	45	12	11,0	10,3	7,79	3	**80292001000022**	**88292001000022**
M12	1,75	10,25	89,0	26,6	45	14	13,5	12,3	9,38	3	**80292001000024**	**88292001000024**
M14	2,00	12,00	102,0	30,4	48	16	15,5	14,3	10,92	4	**80292001000025**	**88292001000025**
M16	2,00	14,00	102,0	34,4	48	18	17,5	16,3	12,83	4	**80292001000026**	**88292001000026**
M20	2,50	17,50	127,0	45,55	56	25	25,0	20,3	15,83	4	**80292001000028**	**88292001000028**

MF Thread Milling Tool MGF XS

with rear chamfer, 1.5×D - 2.0×D

For metric fine ISO thread DIN 13
For machining steel ≥900 N/mm² tensile strength
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide



MF-MGF XS 1,5×D											TiCN - HE	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.
M8×1	1,00	7,00	70,0	13,3	40	10	9,0	8,3	6,22	3	**80273002000070**	**88273002000070**
M10×1	1,00	9,00	74,0	16,5	45	12	11,0	10,3	7,79	3	**80273002000094**	**88273002000094**
M12×1,5	1,50	10,50	83,0	19,9	45	14	13,5	12,3	9,38	3	**80273002000113**	**88273002000113**
M12×1	1,00	11,00	83,0	19,6	45	14	13,5	12,3	9,38	3		
M14×1,5	1,50	12,50	94,5	23,1	48	16	15,5	14,3	10,92	4	**80273002000131**	**88273002000131**
M16×1,5	1,50	14,50	94,5	26,1	48	18	17,5	16,3	12,82	4	**80273002000147**	**88273002000147**

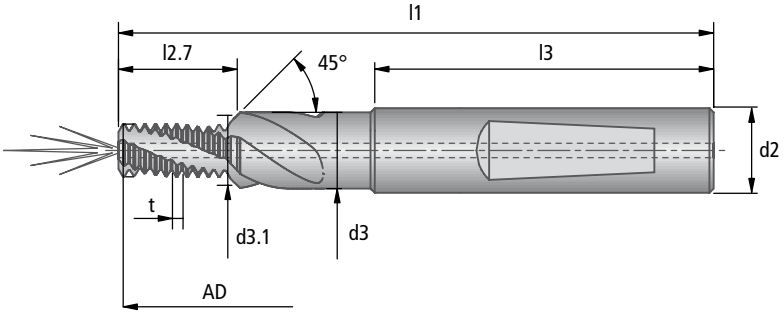
MF-MGF XS 2,0×D											TiCN - HE	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.
M8×1	1,00	7,00	74,0	17,3	40	10	9,0	8,3	6,22	3	**80292002000070**	**88292002000070**
M10×1	1,00	9,00	79,0	21,5	45	12	11,0	10,3	7,79	3	**80292002000094**	**88292002000094**
M12×1,5	1,50	10,50	89,0	25,9	45	14	13,5	12,3	9,38	3	**80292002000113**	**88292002000113**
M12×1	1,00	11,00	89,0	25,6	45	14	13,5	12,3	9,38	3		
M14×1,5	1,50	12,50	102,0	30,6	48	16	15,5	14,3	10,92	4	**80292002000131**	**88292002000131**
M16×1,5	1,50	14,50	102,0	33,6	48	18	17,5	16,3	12,82	4	**80292002000147**	**88292002000147**

G Thread Milling Tool MGF XS

with rear chamfer, 1.5×D - 2.0×D

For Whitworth pipe thread DIN EN ISO 228 and DIN EN 10226 (previously DIN 2999)
For machining steel ≥900 N/mm² tensile strength
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide



G-MGF XS 1,5×D											TiCN - HE	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.
G1/8-28	0,907	8,82	73,6	15,8	45	12	11,0	10,0	7,79	3	**80273025000001**	**88273025000001**
G1/4-19	1,337	11,82	95,3	21,7	48	16	15,5	13,5	10,92	4	**80273025000002**	**88273025000002**

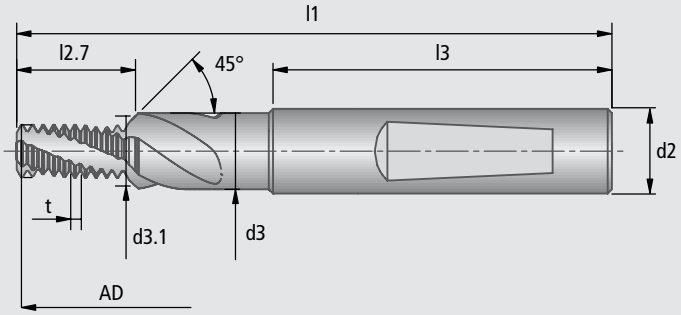
G-MGF XS 2,0×D											TiCN - HE	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.
G1/8-28	0,907	8,82	79,0	21,2	45	12	11,0	10,0	7,79	3	**80292025000001**	**88292025000001**
G1/4-19	1,337	11,82	102,0	28,4	48	16	15,5	13,5	10,92	4	**80292025000002**	**88292025000002**

M Thread Milling Tool MGF XH

with rear chamfer, 1.5×D

For metric ISO thread DIN 13
For hard machining of materials with hardness ≥45 HRC
Shank Ø DIN 6535 Form HE/HA

Tools without internal coolant supply
Cutting material: solid carbide



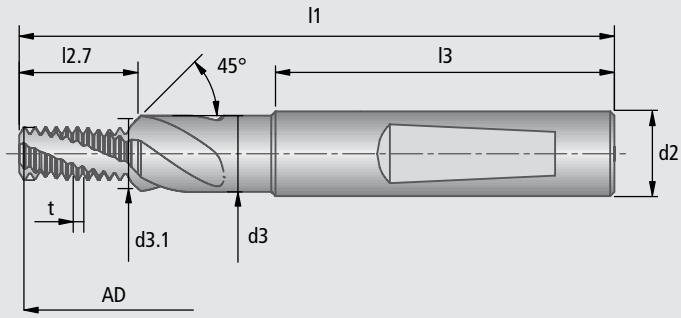
M-MGF XH 1,5×D											TiAlN - HE	TiAlN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.
M4	0,70	3,30	47,0	6,5	36	6	4,5	4,3	3,14	4	**80977001000015**	**88977001000015**
M5	0,80	4,20	52,0	8,2	36	6	5,5	5,3	3,95	4	**80977001000017**	**88977001000017**
M6	1,00	5,00	59,0	10,2	36	8	6,6	6,3	4,68	4	**80977001000018**	**88977001000018**
M8	1,25	6,75	70,0	14,0	40	10	9,0	8,3	6,22	4	**80977001000020**	**88977001000020**
M10	1,50	8,50	74,0	16,8	45	12	11,0	10,3	7,79	5	**80977001000022**	**88977001000022**
M12	1,75	10,25	82,0	19,6	45	14	13,5	12,3	9,38	5	**80977001000024**	**88977001000024**

MF Thread Milling Tool MGF XH

with rear chamfer, 1.5×D

For metric fine ISO thread DIN 13
For hard machining of materials with hardness ≥45 HRC
Shank Ø DIN 6535 Form HE/HA

Tools without internal coolant supply
Cutting material: solid carbide

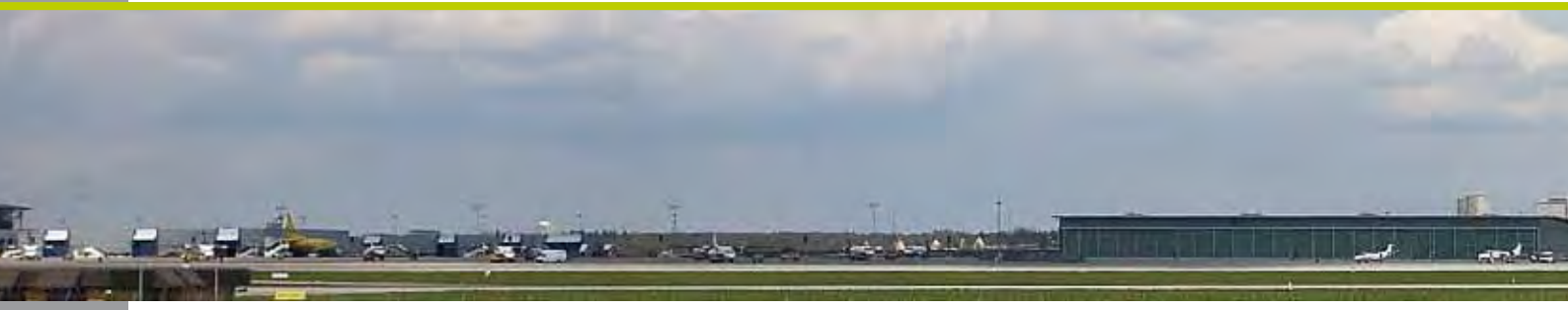


MF-MGF XH 1,5×D											TiAlN - HE	TiAlN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.
M12×1,5	1,50	10,50	82,0	19,9	45	14	13,5	12,3	9,38	5	**80977002000113**	**88977002000113**
M14×1,5	1,50	12,50	94,0	23,1	48	16	15,5	14,3	10,92	5	**80977002000131**	**88977002000131**
M16×1,5	1,50	14,50	94,0	26,1	48	18	17,5	16,3	12,82	5	**80977002000147**	**88977002000147**

Thread Milling Tool UMGF

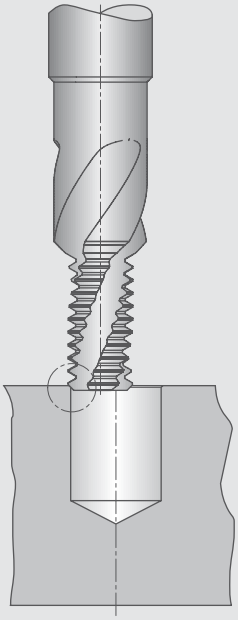
UMGF = Universal MGF Thread Milling Tool
Spiral fluted solid carbide tool with profile correction both with rear and front chamfer.
Diameter range 4-16 mm
This offers the following main advantages compared to the conventional methods of tapping and roll form tapping:

- One and the same tool for different tolerances
- One and the same tool for different diameters
  >Nominal Ø with same pitch

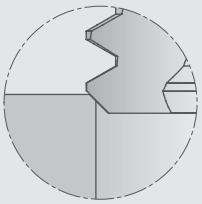


- One and the same tool for blind and through holes
- One and the same tool for different materials
- Exact and repeatable chamfer and thread depth
- No chip root remaining in the thread
- Step drill can be replaced with standard twist drill
- High speed cutting (HSC) possible

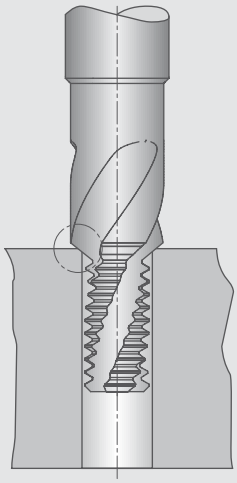
Thread Milling Tool UMGF

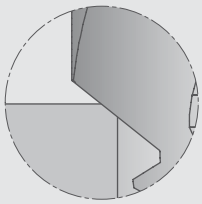


Machining of chamfer by circular movement of the UMGF Thread Milling Tool



Machining of chamfer by concentric movement of the UMGF Thread Milling Tool



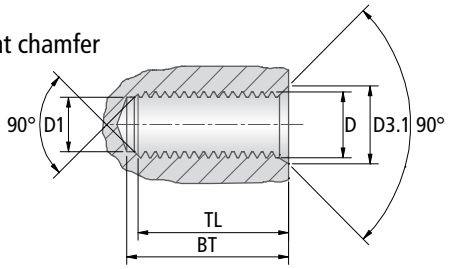


CNC programs can be configured on line at http://tpt.kometgroup.com or can be obtained on request from tel.: +49 (0) 711 78891-0

Thread engagements for UMGF

For metric ISO thread DIN 13 and for metric fine thread DIN 13

BT = Min. drill depth
D3.1 = max. possible chamfer Ø with front chamfer
TL = Full thread length



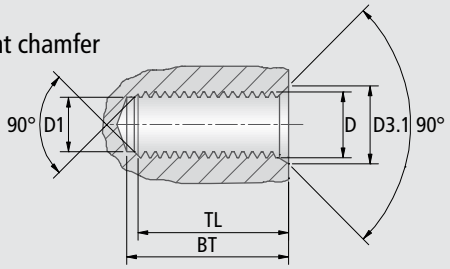
M	2,0×D				2,5×D			
	D1	BT	D3.1	TL	D1	BT	D3.1	TL
M4	3,30	8,58	4,30	7,31	3,30	–	–	–
M5	4,20	10,60	5,30	9,12	4,20	–	–	–
M6	5,00	13,21	6,30	11,36	5,00	16,21	6,30	14,36
M8	6,75	17,76	8,30	15,39	6,75	21,51	8,30	19,14
M10	8,50	21,31	10,30	18,42	8,50	27,31	10,30	24,42
M12	10,30	26,60	12,30	23,21	10,30	31,85	12,30	28,46
M14	12,00	30,40	14,30	26,50	12,00	–	–	–
M16	14,00	34,42	16,30	30,47	14,00	–	–	–

MF	2,0×D			
	D1	BT	D3.1	TL
M8×1	7,00	17,37	8,30	15,29
M10×1	8,00	21,46	10,30	19,17
M12×1,5	10,50	25,98	12,30	22,88
M12×1	11,00	25,57	12,30	23,08
M14×1,5	12,50	30,55	14,30	27,23
M16×1,5	14,50	33,53	16,30	30,21

Thread engagements for UMGF

For UNC thread ANSI B1.1, for UNF thread ANSI B1.1 and for Whitworth pipe thread DIN EN ISO 228 and DIN EN 10226 (previously DIN 2999)

BT = Min. drill depth
D3.1 = max. possible chamfer Ø with front chamfer
TL = Full thread length



UNC	2,0×D			
	D1	BT	D3.1	TL
1/4-20-UNC	5,08	15,46	6,65	13,13
5/16-18-UNC	6,53	17,14	8,24	14,60
3/8-16-UNC	7,94	20,92	9,83	17,94
1/2-13-UNC	10,75	27,83	13,00	23,86

UNF	2,0×D			
	D1	BT	D3.1	TL
1/4-28-UNF	5,44	14,84	6,65	12,94
5/16-24-UNF	6,88	17,23	8,24	15,12
3/8-24-UNF	8,47	20,42	9,83	18,29
7/16-20-UNF	9,84	23,13	11,41	20,72
1/2-20-UNF	11,43	27,36	13,00	24,23

G	2,0×D			
	D1	BT	D3.1	TL
G1/8-28	8,82	21,31	10,03	19,27
G1/4-19	11,82	28,43	13,46	25,72
G3/8-19	15,32	35,24	16,96	32,38

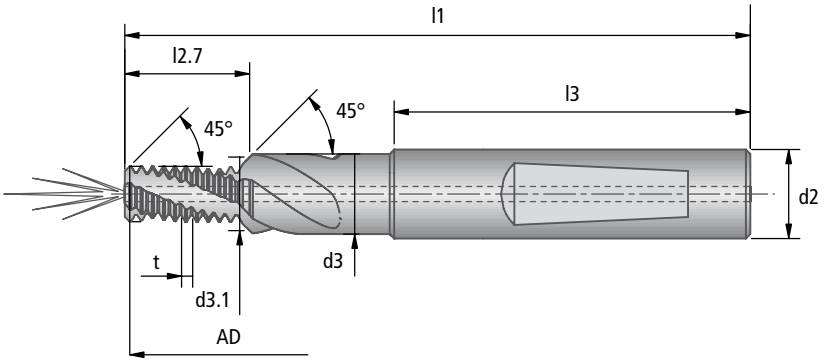
We reserve the right to make technical alterations
Please see note on page 152

M Thread Milling Tool UMGF

with front and rear chamfer, 2.0×D and 2.5×D

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide



M-UMGF 2,0×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M4	0,70	3,30	49,0	8,6	36	6	4,5	4,3	3,14	3				
M5	0,80	4,20	55,0	10,6	36	6	5,5	5,3	3,95	3				
M6	1,00	5,00	62,0	13,2	36	8	6,6	6,3	4,68	3	80670001000018	80692001000018	88670001000018	88692001000018
M8	1,25	6,75	74,0	17,8	40	10	9,0	8,3	6,22	3	80670001000020	80692001000020	88670001000020	88692001000020
M10	1,50	8,50	79,0	21,3	45	12	11,0	10,3	7,79	3	80670001000022	80692001000022	88670001000022	88692001000022
M12	1,75	10,25	89,0	26,6	45	14	13,5	12,3	9,38	3	80670001000024	80692001000024	88670001000024	88692001000024
M14	2,00	12,00	102,0	30,4	48	16	15,5	14,3	10,92	4				
M16	2,00	14,00	102,0	34,4	48	18	17,5	16,3	12,83	4				

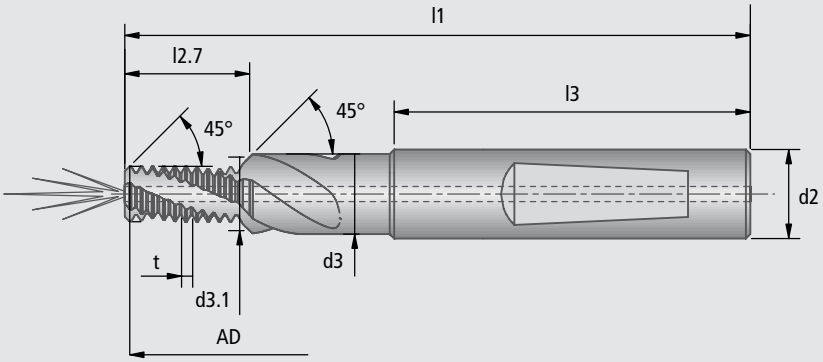
M-UMGF 2,5×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M4	0,70	3,30	49,0	10,0	36	6	4,5	4,3	3,14	3				
M5	0,80	4,20	55,0	13,0	36	6	5,5	5,3	3,95	3				
M6	1,00	5,00	62,0	16,2	36	8	6,6	6,3	4,68	3	80690001000018	80695001000018	88690001000018	88695001000018
M8	1,25	6,75	74,0	21,5	40	10	9,0	8,3	6,22	3	80690001000020	80695001000020	88690001000020	88695001000020
M10	1,50	8,50	79,0	27,3	45	12	11,0	10,3	7,79	3	80690001000022	80695001000022	88690001000022	88695001000022
M12	1,75	10,25	89,0	31,8	45	14	13,5	12,3	9,38	3	80690001000024	80695001000024	88690001000024	88695001000024
M14	2,00	12,00	102,0	38,4	48	16	15,5	14,3	10,92	4				
M16	2,00	14,00	102,0	42,4	48	18	17,5	16,3	12,83	4				

MF Thread Milling Tool UMGF

with front and rear chamfer, 2.0×D

For metric fine ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide



MF-UMGF 2,0×D											uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M8×1	1,0	7,0	74,0	17,3	40	10	9,0	8,3	6,22	3	**80670002000070**	**80692002000070**	**88670002000070**	**88692002000070**
M10×1	1,0	9,0	79,0	21,5	45	12	11,0	10,3	7,79	3	**80670002000094**	**80692002000094**	**88670002000094**	**88692002000094**
M12×1	1,0	11,0	89,0	25,6	45	14	13,5	12,3	9,38	3				
M12×1,5	1,5	10,5	89,0	25,9	45	14	13,5	12,3	9,38	3	**80670002000113**	**80692002000113**	**88670002000113**	**88692002000113**
M14×1,5	1,5	12,5	102,0	30,6	48	16	15,5	14,3	10,92	4	**80670002000131**	**80692002000131**	**88670002000131**	**88692002000131**
M16×1,5	1,5	14,5	102,0	33,6	48	18	17,5	16,3	12,82	4	**80670002000147**	**80692002000147**	**88670002000147**	**88692002000147**

Drill Thread Milling Tool BGF

Drilling, chamfering and thread milling in a single pass

The BGF drill thread milling tool rear chamfer is a standard tool for defined thread lengths of 1.5×D; 2.0×D and 2.5×D.
The patented drill thread milling tool produces a complete thread, including drill hole and chamfer, in a single pass.
This offers the following main advantages compared to the conventional methods of tapping and roll form tapping:

- Only one tool instead of 2 or 3
- Shorter cycle times

- One and the same tool for blind and through holes
- One and the same tool for different materials
- Exact and repeatable drill and thread depth from 1st to last thread
- No chip root remaining in the thread
- High speed cutting (HSC) possible

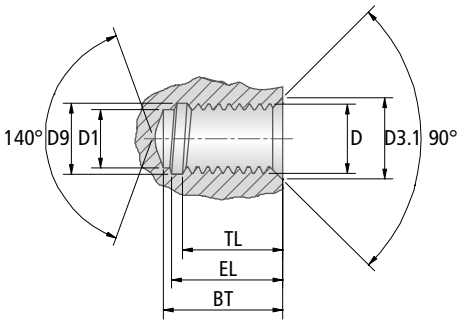
Drill Thread Milling Tool BGF with 2 cutting edges with coolant supply

CNC programs can be configured on line at http://tpt.kometgroup.com or can be obtained on request from tel.: +49 (0) 711 78891-0

Thread engagements for BGF

For metric ISO thread DIN 13, for EG metric ISO thread DIN 8140 for helical wire inserts and for metric fine ISO thread DIN 13

BT = Drill depth
EL = Thread engagement
TL = Full thread length



M	1,5×D						2,0×D						2,5×D					
	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL
M3	2,50	4,90	3,30	3,10	4,40	3,80	2,50	6,90	3,30	3,10	6,40	5,80						
M4	3,30	6,80	4,30	4,12	6,10	5,25	3,30	8,90	4,30	4,12	8,20	7,30	3,30	11,00	4,30	4,12	10,30	9,40
M5	4,20	8,58	5,30	5,19	7,80	6,80	4,20	11,00	5,30	5,19	10,20	9,20	4,20	13,38	5,30	5,19	12,58	11,57
M6	5,00	10,70	6,30	6,25	9,70	8,40	5,00	13,70	6,30	6,25	12,70	11,40	5,00	15,70	6,30	6,25	14,70	13,40
M8	6,75	13,35	8,30	8,41	12,15	10,45	6,75	17,10	8,30	8,41	15,90	14,20	6,75	22,10	8,30	8,41	20,90	19,20
M10	8,50	17,60	10,30	10,54	16,06	14,00	8,50	22,10	10,30	10,54	20,60	18,50	8,50	26,60	10,30	10,54	25,10	23,00
M12	10,30	20,25	12,30	12,65	18,45	16,35	10,30	25,50	12,30	12,65	23,70	21,60	10,30	32,50	12,30	12,65	30,70	28,60
M14	12,00	22,90	14,30	14,81	20,90	18,60	12,00	30,90	14,30	14,81	28,90	26,60	12,00	36,90	14,30	14,81	34,90	32,60
M16	14,00	27,00	16,30	16,88	25,00	22,60	14,00	35,00	16,30	16,88	33,00	30,60	14,00	43,00	16,30	16,88	41,00	38,60

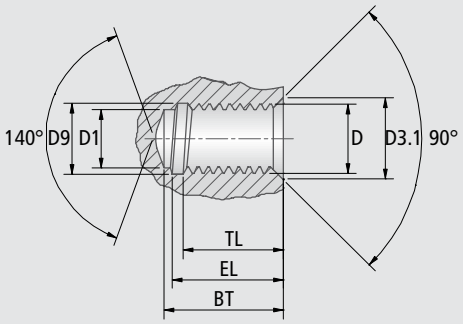
EG	1,5×D						2,0×D						2,5×D					
	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL
EG-M6	6,30	11,78	7,60	7,70	10,80	9,40	6,30	15,78	7,60	7,70	14,80	13,40	6,30	19,78	7,60	7,70	18,80	17,40
EG-M8	8,37	15,99	9,92	10,21	14,70	12,90	8,37	20,99	9,92	10,21	19,70	17,90	8,37	25,99	9,92	10,21	24,70	22,90
EG-M10	10,45	19,18	12,25	12,68	17,70	15,50	10,50	25,18	12,25	12,68	23,70	21,50	10,50	31,18	12,25	12,68	29,70	27,50
EG-M12	12,52	23,85	14,57	15,14	22,10	19,80	12,50	30,85	14,57	15,14	29,10	26,80	12,50	37,85	14,57	15,14	36,10	33,80

MF	1,5×D						2,0×D						2,5×D					
	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL
M6×0,75	5,25	10,30	6,30	6,18	9,60	8,60	5,25	14,05	6,30	6,18	13,30	12,30	5,25	16,30	6,30	6,18	15,60	14,60
M8×1	7,00	13,70	8,30	8,31	12,70	11,40	7,00	17,70	8,30	8,31	16,70	15,40	7,00	21,70	8,30	8,31	20,70	19,40
M10×1	9,00	16,80	10,30	10,35	15,80	14,40	9,00	21,80	10,30	10,35	20,80	19,40	9,00	25,80	10,30	10,35	24,80	23,40
M12×1,5	10,50	20,60	12,30	12,35	19,08	17,01	10,50	26,60	12,30	12,35	25,08	23,01	10,50	32,60	12,30	12,35	31,08	29,01
M12×1	11,00	19,75	12,30	12,35	18,80	17,40	11,00	24,75	12,30	12,35	23,80	22,40	11,00	31,75	12,30	12,35	30,80	29,40
M14×1,5	12,50	23,61	14,30	14,61	22,11	19,98	12,50	29,60	14,30	14,61	28,10	26,00	12,50	37,11	14,30	14,61	35,60	33,50
M16×1,5	14,50	26,62	16,30	16,64	25,12	22,97	14,50	34,10	16,30	16,64	32,60	30,50	14,50	41,62	16,30	16,64	40,10	38,00

Thread engagements for BGF

For UNC thread ANSI B1.1, for UNF thread ANSI B1.1 and for Whitworth pipe thread DIN EN ISO 228 and DIN EN 10226 (previously DIN 2999)

BT = Drill depth
EL = Thread engagement
TL = Full thread length



UNC	1,5×D						2,0×D						2,5×D					
	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL
1/4-20 UNC	5,08	11,09	6,65	6,83	9,82	8,06	5,08	14,90	6,65	6,83	13,60	11,90	5,08	17,44	6,65	6,83	16,20	14,40
5/16-18 UNC	6,53	13,77	8,24	8,56	12,36	10,34	6,53	18,00	8,24	8,56	16,60	14,60	6,53	22,24	8,24	8,56	20,83	18,80
3/8-16 UNC	7,94	16,99	9,83	10,23	15,40	13,20	7,94	21,80	9,83	10,23	20,20	18,00	7,94	26,51	9,83	10,23	24,93	22,73
1/2-13 UNC	10,75	22,56	13,00	13,72	20,60	18,10	10,80	28,40	13,00	13,72	26,50	24,00	10,80	34,28	13,00	13,72	32,33	29,86

UNF	1,5×D						2,0×D						2,5×D					
	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL
1/4-28 UNF	5,44	10,68	6,65	6,70	9,78	8,52	5,44	14,30	6,65	6,70	13,40	12,10	5,44	17,05	6,65	6,70	16,10	14,90
5/16-24 UNF	6,88	13,54	8,24	8,40	12,50	11,00	6,88	17,80	8,24	8,40	16,70	15,20	6,88	20,95	8,24	8,40	19,90	18,40
3/8-24 UNF	8,47	15,67	9,83	10,01	14,61	13,07	8,47	19,90	9,83	10,01	18,80	17,30	8,47	25,19	9,83	10,01	24,10	22,60
1/2-20 UNF	11,43	20,08	13,00	13,35	18,80	16,90	11,40	26,40	13,00	13,35	25,20	23,30	11,40	32,78	13,00	13,35	31,50	29,60

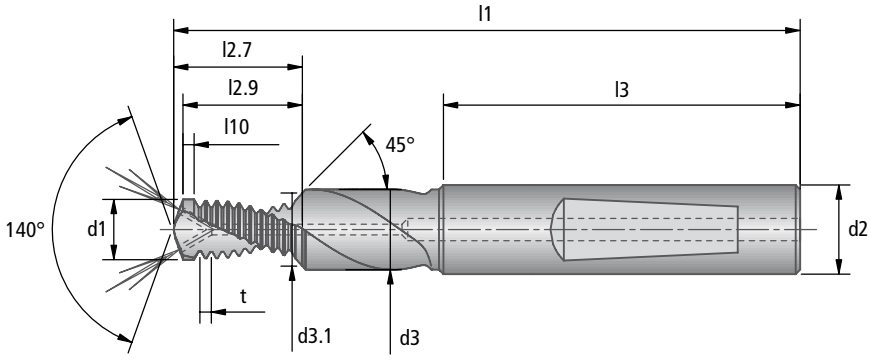
G	1,5×D						2,0×D						2,5×D					
	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL
G1/8-28	8,82	15,25	10,03	10,12	14,34	13,04	8,82	20,70	10,03	10,12	19,80	18,50	8,82	25,23	10,03	10,12	24,30	23,00
G1/4-19	11,82	20,97	13,46	13,52	19,63	17,87	11,80	27,70	13,46	13,52	26,30	24,60	11,80	34,44	13,46	13,52	33,10	31,30

M Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 1.5×D

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



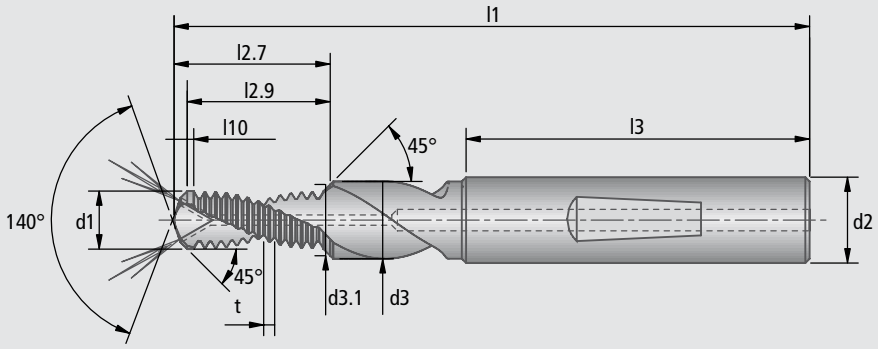
M-BGF 1,5×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M4	0,70	47,0	7,3	6,8	36	0,7	3,3	6	4,5	4,3	3,24	2	**80945001000015**	**80934001000015**	**88945001000015**	**88934001000015**
M5	0,80	52,6	9,3	8,6	36	0,8	4,2	6	5,5	5,3	4,10	2	**80945001000017**	**80934001000017**	**88945001000017**	**88934001000017**
M6	1,00	59,0	11,5	10,7	36	1,0	5,0	8	6,6	6,3	4,85	2	**80945001000018**	**80934001000018**	**88945001000018**	**88934001000018**
M8	1,25	70,3	14,4	13,4	40	1,3	6,8	10	9,0	8,3	6,45	2	**80945001000020**	**80934001000020**	**88945001000020**	**88934001000020**
M10	1,50	74,5	18,9	17,6	45	1,5	8,5	12	11,0	10,3	8,08	2	**80945001000022**	**80934001000022**	**88945001000022**	**88934001000022**
M12	1,75	83,8	21,8	20,2	45	1,5	10,3	14	13,5	12,3	9,74	2	**80945001000024**	**80934001000024**	**88945001000024**	**88934001000024**

M Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 1.5×D for Nodular Grey Cast Iron

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



M-BGF 1,5×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M4	0,70	47,0	7,3	6,8	36	0,7	3,3	6	4,5	4,3	3,24	2				
M5	0,80	52,6	9,3	8,6	36	0,8	4,2	6	5,5	5,3	4,10	2				
M6	1,00	59,0	11,5	10,7	36	1,0	5,0	8	6,6	6,3	4,85	2		**80949001000018**		**88949001000018**
M8	1,25	70,3	14,4	13,4	40	1,3	6,8	10	9,0	8,3	6,45	2		**80949001000020**		**88949001000020**
M10	1,50	74,5	18,9	17,6	45	1,5	8,5	12	11,0	10,3	8,08	2		**80949001000022**		**88949001000022**
M12	1,75	83,8	21,8	20,2	45	1,5	10,3	14	13,5	12,3	9,74	2		**80949001000024**		**88949001000024**

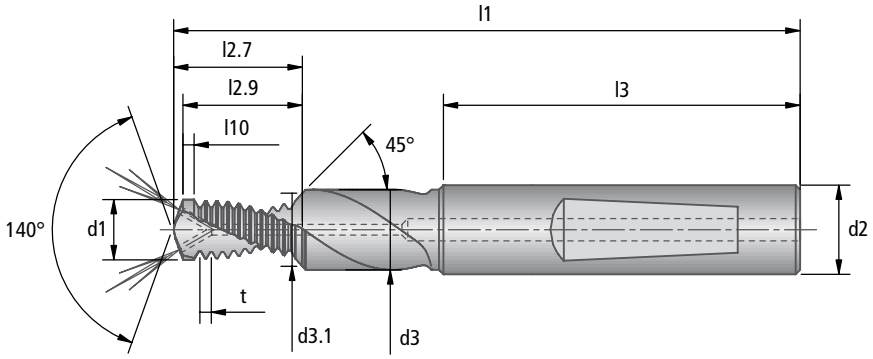
Thread engagements see page 51 in table thread engagements for BGF NZ4 and BGF for Nodular Grey Cast Iron

M Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 2.0×D

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



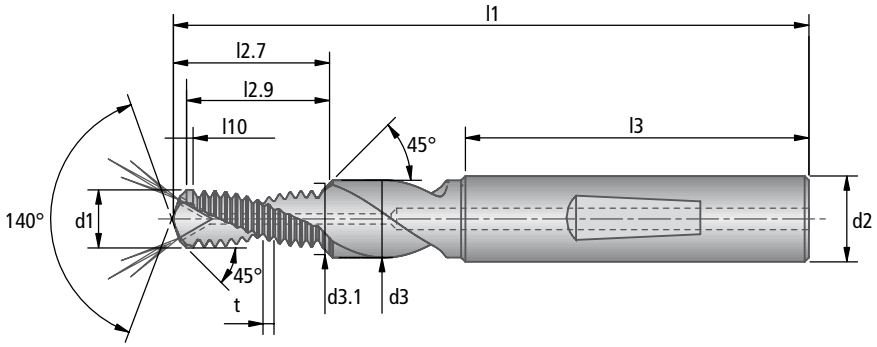
* Tools without internal coolant supply

M-BGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
*M3	0,50	49,0	6,8	7,3	36	0,5	2,5	6	4,5	3,3	2,45	2	80901001000013	80906001000013	88901001000013	88906001000013
M4	0,70	49,0	9,4	8,9	36	0,7	3,3	6	4,5	4,3	3,24	2	80941001000015	80935001000015	88941001000015	88935001000015
M5	0,80	55,0	11,7	11,0	36	0,8	4,2	6	5,5	5,3	4,10	2	80941001000017	80935001000017	88941001000017	88935001000017
M6	1,00	62,0	14,5	13,7	36	1,0	5,0	8	6,6	6,3	4,85	2	80941001000018	80935001000018	88941001000018	88935001000018
M8	1,25	74,0	18,2	17,1	40	1,3	6,8	10	9,0	8,3	6,45	2	80941001000020	80935001000020	88941001000020	88935001000020
M10	1,50	79,0	23,4	22,1	45	1,5	8,5	12	11,0	10,3	8,08	2	80941001000022	80935001000022	88941001000022	88935001000022
M12	1,75	89,0	27,1	25,5	45	1,5	10,3	14	13,5	12,3	9,74	2	80941001000024	80935001000024	88941001000024	88935001000024
M14	2,00	102,0	32,8	30,9	48	1,5	12,0	16	15,5	14,3	11,35	2	80941001000025	80935001000025	88941001000025	88935001000025
M16	2,00	102,0	37,1	35,0	48	1,5	14,0	18	17,5	16,3	13,28	2	80941001000026	80935001000026	88941001000026	88935001000026

with 2 cutting edges with rear chamfer 2.0×D for Nodular Grey Cast Iron

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



M-BGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M4	0,70	47,0	7,3	6,8	36	0,7	3,3	6	4,5	4,3	3,24	2				
M5	0,80	52,6	9,3	8,6	36	0,8	4,2	6	5,5	5,3	4,10	2				
M6	1,00	59,0	11,5	10,7	36	1,0	5,0	8	6,6	6,3	4,85	2		80943001000018		88943001000018
M8	1,25	70,3	14,4	13,4	40	1,3	6,8	10	9,0	8,3	6,45	2		80943001000020		88943001000020
M10	1,50	74,5	18,9	17,6	45	1,5	8,5	12	11,0	10,3	8,08	2		80943001000022		88943001000022
M12	1,75	83,8	21,8	20,2	45	1,5	10,3	14	13,5	12,3	9,74	2		80943001000024		88943001000024

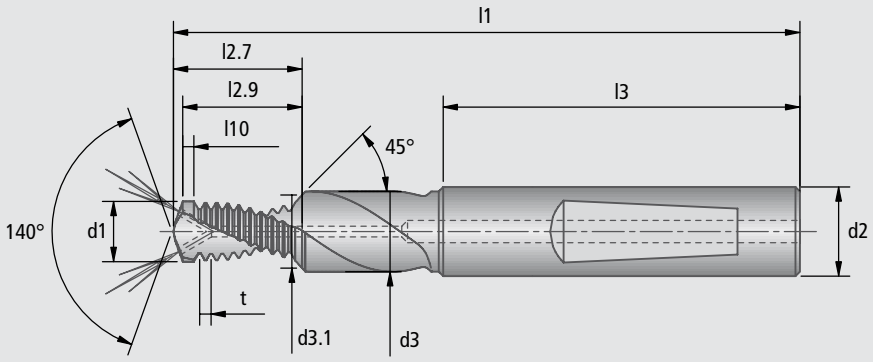
Thread engagements see page 51 in table thread engagements for BGF NZ4 and BGF for Nodular Grey Cast Iron

M Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 2.5×D

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



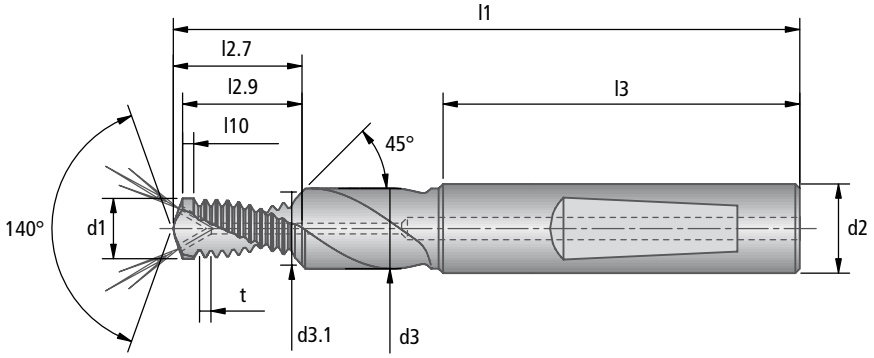
M-BGF 2,5×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M4	0,70	49,0	11,5	11,0	36	0,7	3,3	6	4,5	4,3	3,24	2				
M5	0,80	55,0	14,1	13,4	36	0,8	4,2	6	5,5	5,3	4,10	2	**80961001000017**		**88961001000017**	
M6	1,00	62,0	16,5	15,7	36	1,0	5,0	8	6,6	6,3	4,85	2	**80961001000018**	**80956001000018**	**88961001000018**	**88956001000018**
M8	1,25	74,0	23,2	22,1	40	1,3	6,8	10	9,0	8,3	6,45	2	**80961001000020**	**80956001000020**	**88961001000020**	**88956001000020**
M10	1,50	79,0	27,9	26,6	45	1,5	8,5	12	11,0	10,3	8,08	2	**80961001000022**	**80956001000022**	**88961001000022**	**88956001000022**
M12	1,75	89,0	34,1	32,5	45	1,5	10,3	14	13,5	12,3	9,74	2	**80961001000024**	**80956001000024**	**88961001000024**	**88956001000024**
M14	2,00	102,0	38,8	36,9	48	1,5	12,0	16	15,5	14,3	11,35	2				
M16	2,00	102,0	45,1	43,0	48	1,5	14,0	18	17,5	16,3	13,28	2	**80961001000026**		**88961001000026**	

EG Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 2.0×D

For EG metric ISO thread DIN 8140
for helical wire inserts
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



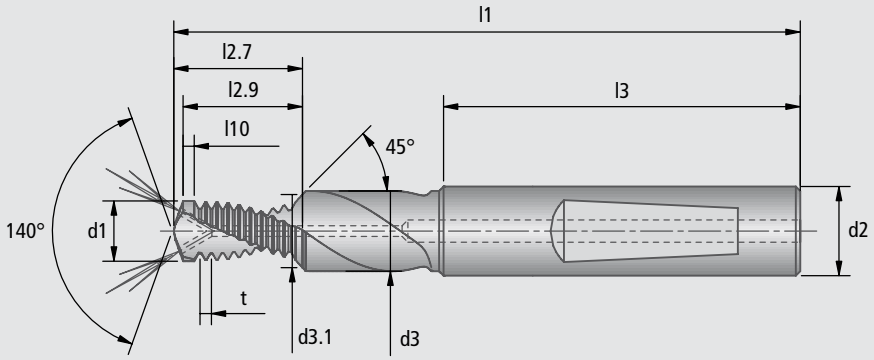
EG-BGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
EG-M6	1,00	74,0	16,8	15,8	40	1,0	6,3	10	9	7,6	5,98	2	**80941051000018**	**80935051000018**	**88941051000018**	**88935051000018**
EG-M8	1,25	78,0	22,3	21,0	45	1,3	8,4	12	11	9,9	7,89	2	**80941051000020**	**80935051000020**	**88941051000020**	**88935051000020**
EG-M10	1,50	87,5	26,8	25,2	45	1,5	10,5	14	14	12,3	9,83	2	**80941051000022**	**80935051000022**	**88941051000022**	**88935051000022**
EG-M12	1,75	102,0	32,8	30,9	48	1,5	12,5	16	16	14,6	11,80	2	**80941051000024**	**80935051000024**	**88941051000024**	**88935051000024**

MF Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 1.5×D

For metric fine ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



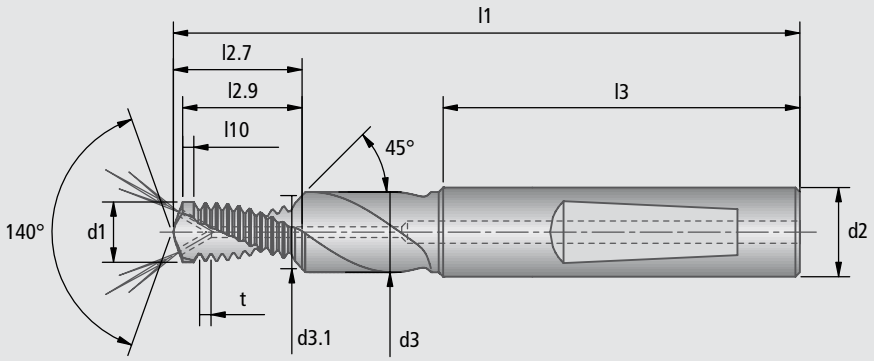
MF-BGF 1,5×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M8×1	1,0	70,0	14,8	13,7	40	1,0	7,0	10	9,0	8,3	6,79	2	**80945002000070**		**88945002000070**	
M10×1	1,0	74,0	18,2	16,8	45	1,0	9,0	12	11,0	10,3	8,75	2	**80945002000094**		**88945002000094**	
M12×1,5	1,5	83,0	22,2	20,6	45	1,5	10,5	14	13,5	12,3	10,06	2	**80945002000113**		**88945002000113**	

MF Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 2.0×D

For metric fine ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



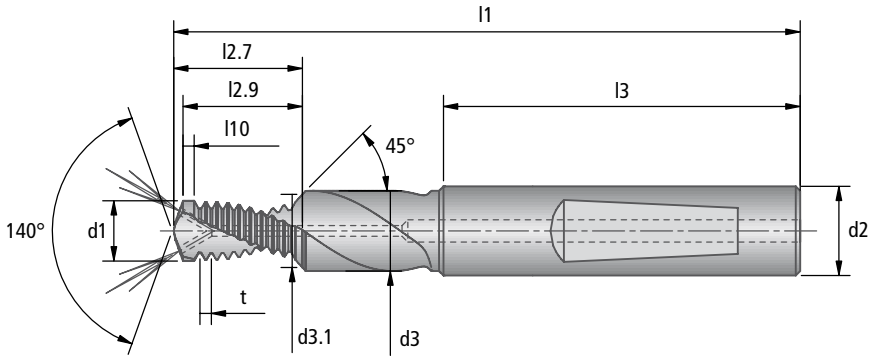
MF-BGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M6×0,75	0,75	62,0	14,9	13,3	36	0,8	5,25	8	6,6	6,3	5,14	2	**80941002000048**		**88941002000048**	
M8×1	1,00	74,0	18,8	17,7	40	1,0	7,00	10	9,0	8,3	6,79	2	**80941002000070**	**80935002000070**	**88941002000070**	**88935002000070**
M10×1	1,00	79,0	23,2	21,8	45	1,0	9,00	12	11,0	10,3	8,75	2	**80941002000094**	**80935002000094**	**88941002000094**	**88935002000094**
M12×1	1,00	89,0	26,4	24,8	45	1,0	11,00	14	13,5	12,3	10,74	2	**80941002000111**	**80935002000111**	**88941002000111**	**88935002000111**
M12×1,5	1,50	89,0	28,2	26,6	45	1,5	10,50	14	13,5	12,3	10,06	2	**80941002000113**	**80935002000113**	**88941002000113**	**88935002000113**
M14×1,5	1,50	102,0	31,5	29,6	48	1,5	12,50	16	15,5	14,3	12,01	2	**80941002000131**		**88941002000131**	
M16×1,5	1,5	102,0	36,3	34,1	48	1,5	14,50	18	17,5	16,3	13,95	2	**80941002000147**		**88941002000147**	

UNC Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 1.5×D

For UNC thread ANSI B1.1
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



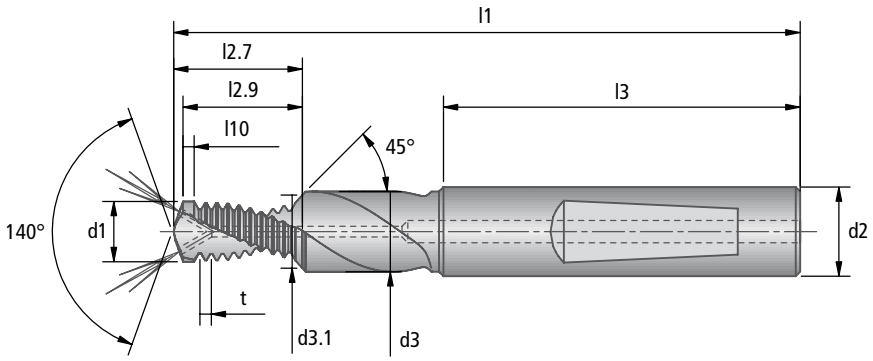
UNC-BGF 1,5×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
1/4-20 UNC	1,270	58,2	11,9	11,1	36	1,3	5,1	8	7,8	6,7	4,70	2	**80945010000011**		**88945010000011**	
5/16-18 UNC	1,411	69,8	14,8	13,8	40	1,4	6,5	10	9,0	8,2	6,01	2	**80945010000012**		**88945010000012**	
3/8-16 UNC	1,588	74,2	18,2	17,0	45	1,5	7,9	12	11,0	9,8	7,36	2	**80945010000013**		**88945010000013**	
1/2-13 UNC	1,954	83,0	24,2	22,6	45	1,5	10,8	14	13,5	13,0	9,87	2	**80945010000015**		**88945010000015**	

UNC Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 2.0×D

For UNC thread ANSI B1.1
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



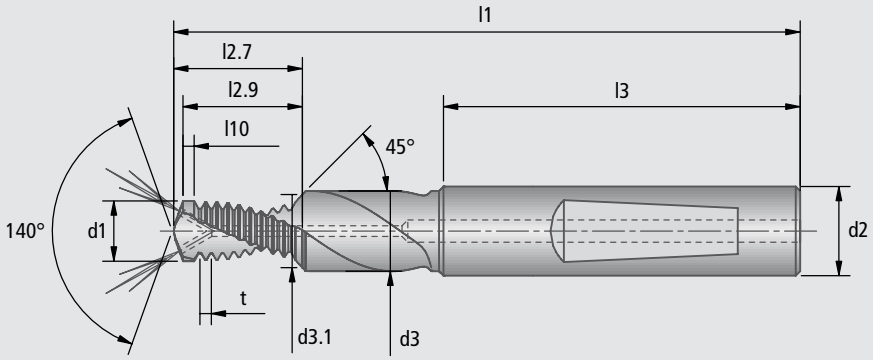
UNC-BGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
1/4-20 UNC	1,270	62,0	15,7	14,9	36	1,3	5,1	8	7,8	6,7	4,70	2	**80941010000011**		**88941010000011**	
5/16-18 UNC	1,411	74,0	19,0	18,0	40	1,4	6,5	10	9,0	8,2	6,01	2	**80941010000012**		**88941010000012**	
3/8-16 UNC	1,588	79,0	23,0	21,8	45	1,5	7,9	12	11,0	9,8	7,36	2	**80941010000013**		**88941010000013**	
1/2-13 UNC	1,954	89,0	30,1	28,4	45	1,5	10,8	14	13,5	13,0	9,87	2	**80941010000015**		**88941010000015**	

UNF Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 1.5×D

For UNF thread ANSI B1.1
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



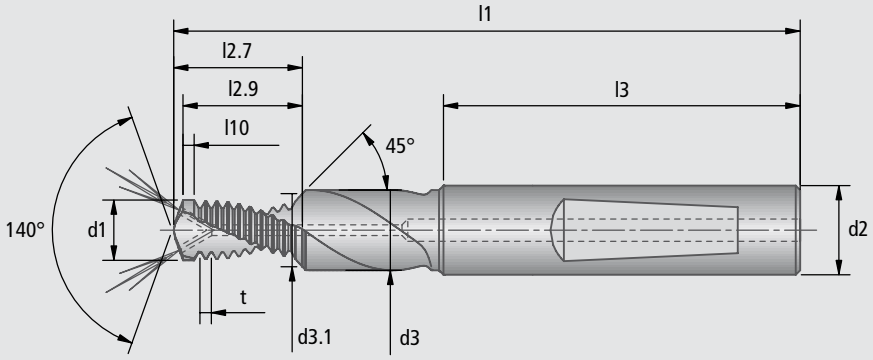
UNF-BGF 1,5×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
1/4-28 UNF	0,907	58,4	11,5	10,7	36	0,9	5,4	8	7,8	6,7	5,17	2	**80945011000011**		**88945011000011**	
5/16-24 UNF	1,058	70,0	14,6	13,5	40	1,1	6,9	10	9,0	8,2	6,51	2	**80945011000012**		**88945011000012**	
3/8-24 UNF	1,058	74,8	17,0	15,7	45	1,1	8,5	12	11,0	9,8	8,07	2	**80945011000013**		**88945011000013**	
1/2-20 UNF	1,270	82,7	21,8	20,1	45	1,3	11,4	14	13,5	13,0	10,88	2	**80945011000015**		**88945011000015**	

UNF Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 2.0×D

For UNF thread ANSI B1.1
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



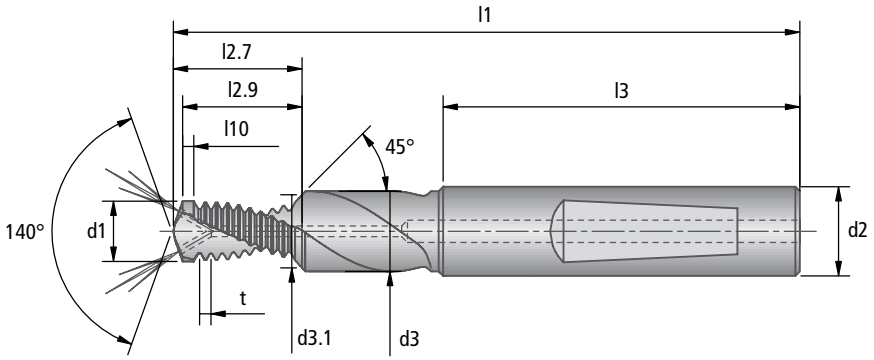
UNF-BGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
1/4-28 UNF	0,907	62,0	15,2	14,3	36	0,9	5,4	8	7,8	6,7	5,17	2	**80941011000011**		**88941011000011**	
5/16-24 UNF	1,058	74,0	18,8	17,8	40	1,1	6,9	10	9,0	8,2	6,51	2	**80941011000012**		**88941011000012**	
3/8-24 UNF	1,058	79,0	21,2	19,9	45	1,1	8,5	12	11,0	9,8	8,07	2	**80941011000013**		**88941011000013**	
1/2-20 UNF	1,270	89,0	28,2	26,4	45	1,3	11,4	14	13,5	13,0	10,88	2	**80941011000015**		**88941011000015**	

G Drill Thread Milling Tool BGF

with 2 cutting edges with rear chamfer 2.0×D

For Whitworth pipe thread DIN EN ISO 228 and DIN EN 10226 (previously DIN 2999)
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



G-BGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nom. Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
G1/8-28	0,907	79,0	22,1	20,7	45	0,9	8,8	12	11,0	10,0	8,40	2	**80941025000001**		**88941025000001**	
G1/4-19	1,337	102,0	29,5	27,7	48	1,3	11,8	16	13,5	13,5	11,44	2	**80941025000002**		**88941025000002**	

Drill Thread Milling Tools

Drilling, chamfering and thread milling in a single pass

Drill Thread Milling Tool BGF

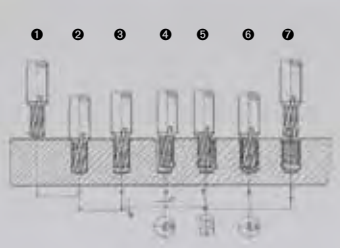
BGF with rear chamfer as a standard tool for defined thread lengths of 1.5×D; 2.0×D and 2.5×D.
UBGF with front and rear chamfer for different thread lengths.

Cross section of threads manufactured with drill thread milling tools – here M6 and M10. BGF with profile correction are generating a precise part threads.

BGF M12 2.0×D TiN

BGF M10 2.5×D TiAN

BGF, 3 fluted with spot face cutter



❶ Approach
❷ Drilling and chamfering
❸ Withdraw
❹ Radial setting to nominal thread diameter through entry loop
❺ Forward feed by pitch with simultaneous interpolation of tool around the central thread axis-threading cycle
❻ Radial movement back to the bore centre through exit loop
❼ Exit bore

BGF with 3 flutes

Advantages compared to 2 flutes

- Pre-cast holes can be drilled with maximum cutting values without problems
- Increased tool stability
- For angled bore exits

Advantages

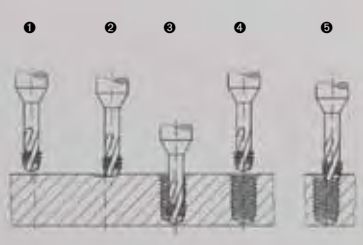
- More than 50% shorter cycle time and idle time reduction due to high cutting speeds and feed and saving on tool changing times and tool changes
- Excellent surface finish due to variation in cutting parameters
- Same tools for blind bores and through holes
- Can be used in cast iron, aluminium up to 2.5×D
- Nodular Grey Cast Iron up to 2.0×D

DBGF

DBGF Direct Circular Drill Thread Milling Tool

To complete our product range we are including the DBGF direct circular drill thread milling tool in the diameter range from 6 to 16 mm with an achievable thread depth of up to 3.0×D. Also suitable for steel materials up to a thread depth of 2.0×D

❶ Approach
❷ Circular milling of the chamfer
❸ Circular drilling and thread milling. The bore and the thread are manufactured simultaneously in one pass
❹ Exit bore
❺ If necessary circular deburring of first thread



Drill Thread Milling Tool UBGF

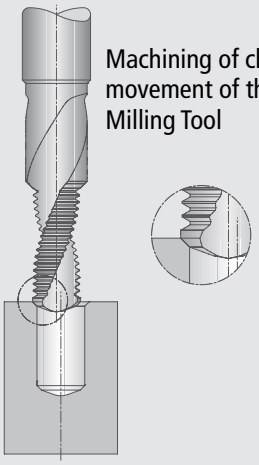
Drilling, chamfering and thread milling in a single pass

UBGF with front and rear chamfer for different thread lengths.

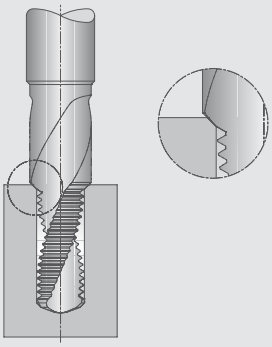
Drill Thread Milling Tool

- UBGF with 2 cutting edges
- BGF with 3 cutting edges
- BGF with 4 cutting edges for grey cast iron
- DBGF Direct Circular Drill Thread Milling Tool

JEL



Machining of chamfer by circular movement of the UBGF Drill Thread Milling Tool



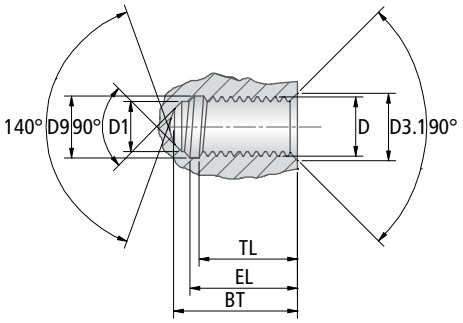
Machining of chamfer by concentric movement of the UBGF Drill Thread Milling Tool

CNC programs can be configured on line at http://tpt.kometgroup.com or can be obtained on request from tel.: +49 (0) 711 78891-0

Thread engagements for UBGF

For metric ISO thread DIN 13 and for metric fine ISO thread DIN 13

BT = Drill depth
D3.1 = max. possible chamfer Ø with front chamfer
EL = Thread engagement
TL = Full thread length



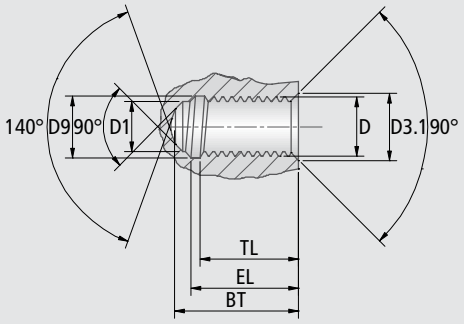
M	2,0×D					
	D1	BT	D3.1	D9	EL	TL
M3	2,50	6,65	3,30	3,10	6,10	5,80
M4	3,30	8,58	4,30	4,12	7,90	7,30
M5	4,20	10,63	5,30	5,19	9,80	9,20
M6	5,00	13,28	6,30	6,25	12,30	11,40
M8	6,80	16,64	8,30	8,41	15,40	14,20
M10	8,50	21,49	10,30	10,54	20,00	18,50
M12	10,30	24,83	12,30	12,65	23,10	21,60
M14	12,00	30,19	14,30	14,81	28,20	26,60
M16	14,00	34,23	16,30	16,88	32,20	30,60

MF	2,0×D					
	D1	BT	D3.1	D9	EL	TL
M6×0,75	5,25	12,97	6,30	6,18	12,20	11,60
M8×1	7,00	17,70	8,30	8,31	16,70	15,40
M10×1	9,00	21,39	10,30	10,35	20,40	19,40
M12×1	11,00	24,34	12,30	12,35	23,30	22,40
M12×1,5	10,50	26,01	12,30	12,35	24,50	23,00
M14×1,5	12,50	29,03	14,30	14,61	27,50	26,00
M16×1,5	14,50	33,53	16,30	16,64	32,00	30,50

Thread engagements for UBGF

For UNC thread ANSI B1.1, UNF thread ANSI B1.1 and for Whitworth pipe thread DIN EN ISO 228 and DIN EN 10226 (previously DIN 2999)

BT = Drill depth
D3.1 = max. possible chamfer Ø with front chamfer
EL = Thread engagement
TL = Full thread length



UNC	2,0×D					
	D1	BT	D3.1	D9	EL	TL
1/4-20 UNC	5,08	14,41	6,65	6,83	13,10	11,90
5/16-18 UNC	6,53	17,46	8,24	8,56	16,00	14,60
3/8-16 UNC	7,94	21,15	9,83	10,23	19,60	18,00
1/2-13 UNC	10,75	27,70	13,00	13,72	25,70	24,00

UNF	2,0×D					
	D1	BT	D3.1	D9	EL	TL
1/4-28 UNF	5,44	13,94	6,65	6,70	13,00	12,10
5/16-24 UNF	6,88	17,34	8,24	8,40	16,30	15,20
3/8-24 UNF	8,47	19,47	9,83	10,01	18,40	17,30
1/2-20 UNF	11,43	25,94	13,00	13,35	24,70	23,30

G	2,0×D					
	D1	BT	D3.1	D9	EL	TL
G1/8-28	8,82	20,30	10,03	10,12	19,40	18,50
G1/4-19	11,82	27,10	13,46	13,52	25,70	24,50

Thread engagements for BGF NZ4 and BGF for Nodular Grey Cast Iron

M	1,5 x D						2,0 x D						2,5 x D					
	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL	D1	BT	D3.1	D9	EL	TL
M6	5,00	10,37	6,30	6,25	9,40	8,40	5,00	13,47	6,30	6,25	12,50	11,40	5,00	15,47	6,30	6,25	14,50	13,40
M8	6,75	13,02	8,30	8,41	11,80	10,50	6,75	16,77	8,30	8,41	15,50	14,30	6,75	21,77	8,30	8,41	20,50	19,30
M10	8,50	17,07	10,30	10,54	15,60	14,10	8,50	21,57	10,30	10,54	20,10	18,60	8,50	26,07	10,30	10,54	24,60	23,10
M12	10,30	19,65	12,30	12,65	17,90	16,40	10,30	24,90	12,30	12,65	23,10	21,60	10,30	31,90	12,30	12,65	30,10	28,60
M14	12,00	22,44	14,30	14,81	20,40	18,60	12,00	30,44	14,30	14,81	28,40	26,60	12,00	36,44	14,30	14,81	34,40	32,60
M16	14,00	26,45	16,30	16,88	24,50	22,60	14,00	34,45	16,30	16,88	32,50	30,60	14,00	42,45	16,30	16,88	40,50	38,60

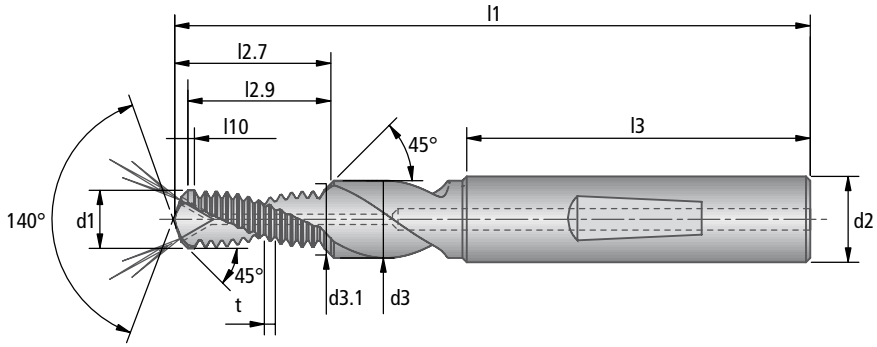
Tool selection BGF for nodular grey cast iron see chapter 3

M Drill Thread Milling Tool UBGF

with 2 cutting edges with front and rear chamfer 2.0×D

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



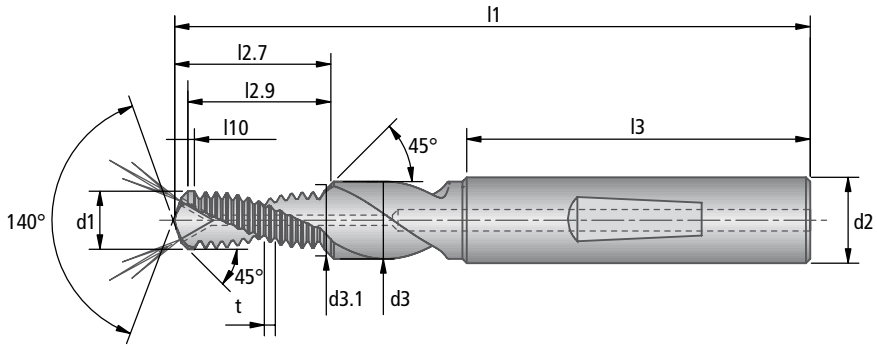
M-UBGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nominal Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M4	0,70	49,0	9,4	8,6	36	0,4	3,3	6	4,5	4,3	3,24	2				
M5	0,80	55,0	12,5	11,4	36	0,5	4,2	6	5,5	5,3	4,10	2				
M6	1,00	62,0	14,5	13,3	36	0,6	5,0	8	6,6	6,3	4,85	2	80641001000018	80635001000018	88641001000018	88635001000018
M8	1,25	74,0	19,4	17,9	40	0,8	6,8	10	9,0	8,3	6,45	2	80641001000020	80635001000020	88641001000020	88635001000020
M10	1,50	79,0	23,4	21,5	45	0,9	8,5	12	11,0	10,3	8,08	2	80641001000022	80635001000022	88641001000022	88635001000022
M12	1,75	89,0	28,8	26,6	45	0,9	10,3	14	13,5	12,3	9,74	2	80641001000024	80635001000024	88641001000024	88635001000024
M14	2,00	102,0	32,8	30,2	48	0,8	12,0	16	15,5	14,3	11,35	2				
M16	2,00	102,0	37,1	34,2	48	0,8	14,0	18	17,5	16,3	13,28	2				

MF Drill Thread Milling Tool UBGF

with 2 cutting edges with front and rear chamfer 2.0×D

For metric fine ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



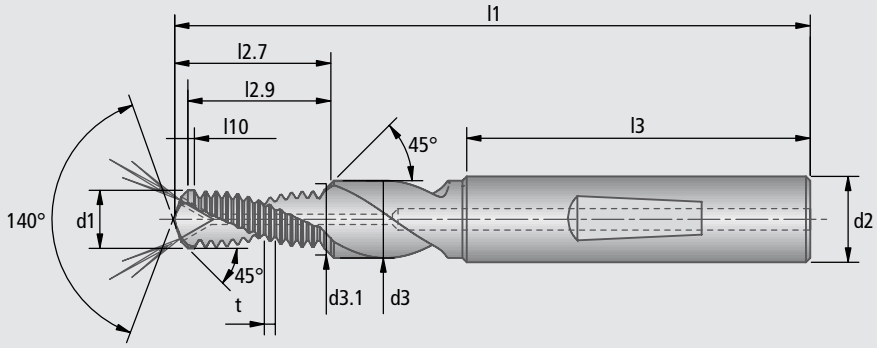
MF-UBGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nominal Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M6×0,75	0,75	61,7	14,9	13,0	36	0,4	5,3	8	6,6	6,3	5,14	2	80641002000048		88641002000048	
M8×1	1,00	74,0	18,8	17,3	40	0,6	7,0	10	9,0	8,3	6,79	2	80641002000070	80635002000070	88641002000070	88635002000070
M10×1	1,00	79,0	24,2	22,4	45	0,6	9,0	12	11,0	10,3	8,75	2	80641002000094	80635002000094	88641002000094	88635002000094
M12×1	1,00	88,4	26,4	24,3	45	0,6	11,0	14	13,5	12,3	10,74	2	80641002000111	80635002000111	88641002000111	88635002000111
M12×1,5	1,50	89,0	28,2	26,0	45	0,9	10,5	14	13,5	12,3	10,06	2	80641002000113	80635002000113	88641002000113	88635002000113
M14×1,5	1,50	102,0	33,0	30,5	48	0,9	12,5	16	15,5	14,3	12,01	2	80641002000131		88641002000131	
M16×1,5	1,50	102,0	36,3	33,5	48	0,9	14,5	18	17,5	16,3	13,95	2				

UNC Drill Thread Milling Tool UBGF

with 2 cutting edges with front and rear chamfer 2.0×D

For UNC thread ANSI B1.1
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



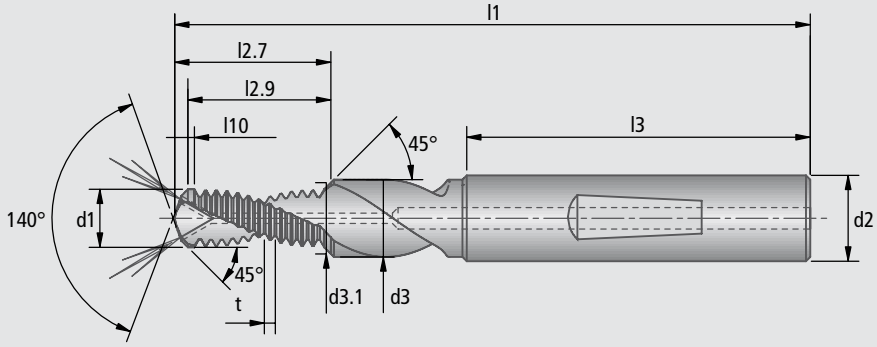
UNC-UBGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nominal Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
1/4-20 UNC	1,270	62,0	15,7	14,4	36	0,8	5,1	8	7,8	6,7	4,70	2	**80641010000011**		**88641010000011**	
5/16-18 UNC	1,411	74,0	19,0	17,5	40	0,9	6,5	10	9,0	8,2	6,01	2	**80641010000012**		**88641010000012**	
3/8-16 UNC	1,588	79,0	23,0	21,2	45	0,9	7,9	12	11,0	9,8	7,36	2	**80641010000013**		**88641010000013**	
1/2-13 UNC	1,954	89,0	30,1	27,7	45	0,8	10,8	14	13,5	13,0	9,87	2	**80641010000015**		**88641010000015**	

UNF Drill Thread Milling Tool UBGF

with 2 cutting edges with front and rear chamfer 2.0×D

For UNF thread ANSI B1.1
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



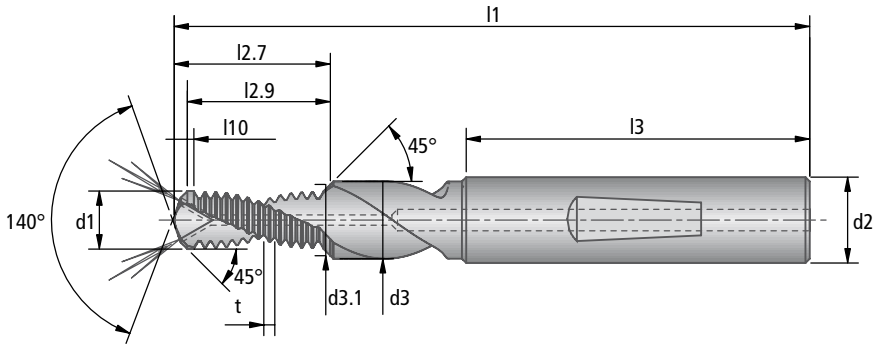
UNF-UBGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nominal Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
1/4-28 UNF	0,907	62,0	15,2	13,9	36	0,5	5,4	8	7,8	6,7	5,17	2	**80601011000011**		**88601011000011**	
5/16-24 UNF	1,058	74,0	18,8	17,3	40	0,6	6,9	10	9,0	8,2	6,51	2	**80601011000012**		**88601011000012**	
3/8-24 UNF	1,058	79,0	22,3	20,5	45	0,6	8,5	12	11,0	9,8	8,07	2	**80601011000013**		**88601011000013**	
1/2-20 UNF	1,270	89,0	29,5	27,2	45	0,8	11,4	14	13,5	13,0	10,88	2	**80601011000015**		**88601011000015**	

G Drill Thread Milling Tool UBGF

with 2 cutting edges with front and rear chamfer 2.0×D

For Whitworth pipe thread DIN EN ISO 228 and DIN EN 10226 (previously DIN 2999)
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



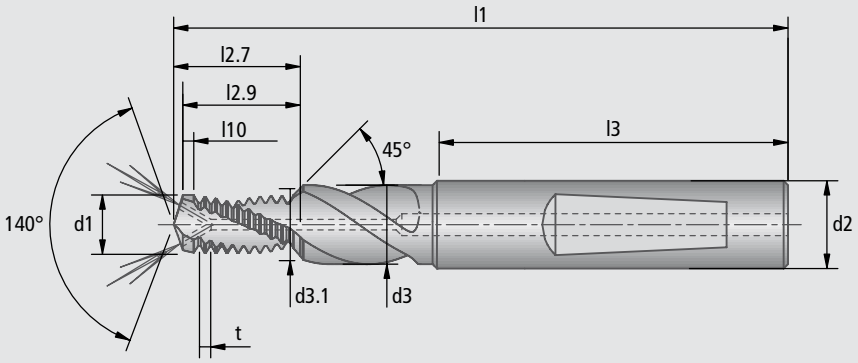
G-UBGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nominal Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
G1/8-28	0,907	79,0	22,1	20,3	45	0,5	8,8	12	11,0	10,0	8,40	2	**80601025000001**		**88601025000001**	
G1/4-19	1,337	102,0	30,8	28,5	48	0,8	11,8	16	15,5	13,5	11,44	2	**80601025000002**		**88601025000002**	

M Drill Thread Milling Tool BGF

with 3 cutting edges with rear chamfer 1.5×D; 2.0×D and 2.5×D

For metric ISO thread DIN 13
For precasted holes
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



M-BGF 1,5×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nominal Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M6	1,00	59,0	11,5	10,7	36	1,0	5,0	8	6,6	6,3	4,85	3	80345001000018	80334001000018	88345001000018	88334001000018
M8	1,25	70,3	14,4	13,4	40	1,3	6,8	10	9,0	8,3	6,45	3	80345001000020	80334001000020	88345001000020	88334001000020
M10	1,50	74,5	18,9	17,6	45	1,5	8,5	12	11,0	10,3	8,08	3	80345001000022	80334001000022	88345001000022	88334001000022
M12	1,75	83,8	21,8	20,2	45	1,5	10,3	14	13,5	12,3	9,74	3	80345001000024	80334001000024	88345001000024	88334001000024

M-BGF 2,0×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nominal Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M6	1,00	62,0	14,5	13,7	36	1,0	5,0	8	6,6	6,3	4,85	3	80341001000018	80335001000018	88341001000018	88335001000018
M8	1,25	74,0	18,2	17,1	40	1,3	6,8	10	9,0	8,3	6,45	3	80341001000020	80335001000020	88341001000020	88335001000020
M10	1,50	79,0	23,4	22,1	45	1,5	8,5	12	11,0	10,3	8,08	3	80341001000022	80335001000022	88341001000022	88335001000022
M12	1,75	89,0	27,1	25,5	45	1,5	10,3	14	13,5	12,3	9,74	3	80341001000024	80335001000024	88341001000024	88335001000024

M-BGF 2,5×D													uncoated - HE	TiAlN - HE	uncoated - HA	TiAlN - HA
Nominal Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.	Order No.	Order No.
M6	1,00	62,0	16,5	15,7	36	1,0	5,0	8	6,6	6,3	4,85	3	80361001000018	80356001000018	88361001000018	88356001000018
M8	1,25	74,0	23,2	22,1	40	1,3	6,8	10	9,0	8,3	6,45	3	80361001000020	80356001000020	88361001000020	88356001000020
M10	1,50	79,0	27,9	26,6	45	1,5	8,5	12	11,0	10,3	8,08	3	80361001000022	80356001000022	88361001000022	88356001000022
M12	1,75	89,0	34,1	32,5	45	1,5	10,3	14	13,5	12,3	9,74	3	80361001000024	80356001000024	88361001000024	88356001000024

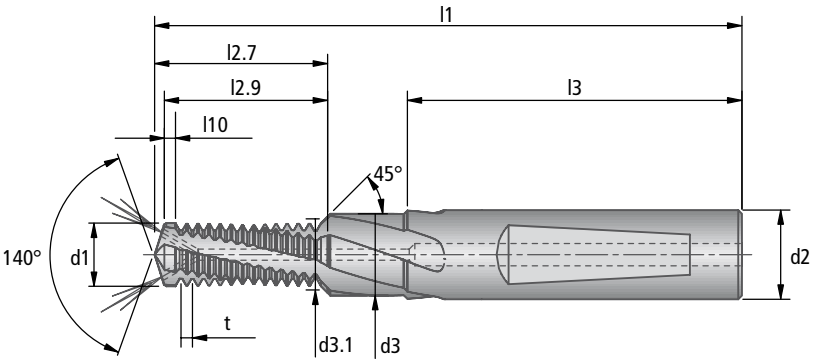
Thread engagements see page 36.

M Drill Thread Milling Tool BGF NZ4

with 4 cutting edges with rear chamfer 1.5×D

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



M-BGF 1,5xD													AlCrN - HE	AlCrN - HA
Nominal Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.
M6	1,00	59,0	11,6	10,5	36	0,8	5,0	8	6,6	6,3	4,85	4	**80369001000018**	**88369001000018**
M8	1,25	70,3	14,5	13,0	40	1,0	6,8	10	9,0	8,3	6,61	4	**80369001000020**	**88369001000020**
M10	1,50	74,7	19,0	17,1	45	1,1	8,5	12	11,0	10,3	8,29	4	**80369001000022**	**88369001000022**
M12	1,75	83,8	22,0	19,7	45	1,1	10,3	14	13,5	12,3	10,00	4	**80369001000024**	**88369001000024**
M14	2,00	94,0	25,1	22,4	48	1,0	12,0	16	15,5	14,3	11,35	4		
M16	2,00	94,0	29,5	26,5	48	1,0	14,0	18	17,5	16,3	13,27	4		

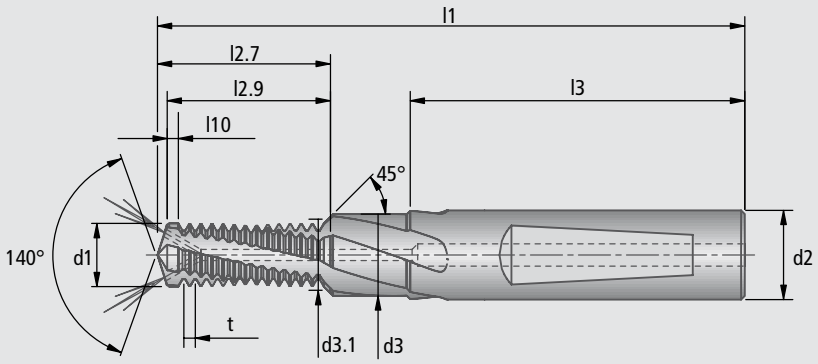
Thread engagements see page 51 in table thread engagements for BGF NZ4 and BGF for Nodular Grey Cast Iron

M Drill Thread Milling Tool BGF NZ4

with 4 cutting edges with rear chamfer 2.0×D and 2.5×D

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



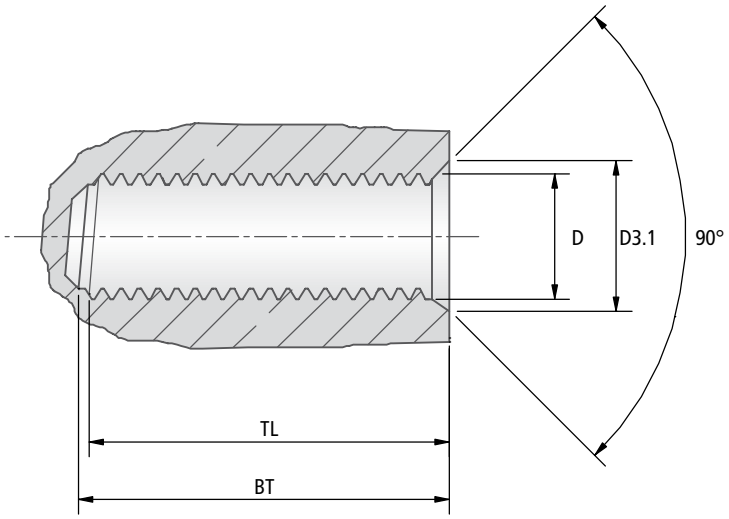
M-BGF 2,0xD													AlCrN - HE	AlCrN - HA
Nominal Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.
M6	1,00	62,0	14,6	13,5	36	0,8	5,0	8	6,6	6,3	4,85	4	80373001000018	88373001000018
M8	1,25	74,0	18,3	16,8	40	1,0	6,8	10	9,0	8,3	6,61	4	80373001000020	88373001000020
M10	1,50	79,0	23,5	21,6	45	1,1	8,5	12	11,0	10,3	8,29	4	80373001000022	88373001000022
M12	1,75	89,0	27,2	24,9	45	1,1	10,3	14	13,5	12,3	10,00	4	80373001000024	88373001000024
M14	2,00	102,0	33,1	30,4	48	1,0	12,0	16	15,5	14,3	11,35	4		
M16	2,00	102,0	37,5	34,5	48	1,0	14,0	18	17,5	16,3	13,27	4		

M-BGF 2,5xD													AlCrN - HE	AlCrN - HA
Nominal Ø	t	l1	l2.7	l2.9	l3	l10	d1	d2	d3	d3.1	AD	Z	Order No.	Order No.
M6	1,00	62,0	16,6	15,5	36	0,8	5,0	8	6,6	6,3	4,85	4	80380001000018	88380001000018
M8	1,25	74,0	23,3	21,8	40	1,0	6,8	10	9,0	8,3	6,61	4	80380001000020	88380001000020
M10	1,50	79,0	28,0	26,1	45	1,1	8,5	12	11,0	10,3	8,29	4	80380001000022	88380001000022
M12	1,75	89,0	34,2	31,9	45	1,1	10,3	14	13,5	12,3	10,00	4	80380001000024	88380001000024
M14	2,00	102,0	39,1	36,4	48	1,0	12,0	16	15,5	14,3	11,35	4		
M16	2,00	102,0	45,5	42,5	48	1,0	14,0	18	17,5	16,3	13,27	4		

Thread engagements see page 51 in table thread engagements for BGF NZ4 and BGF for Nodular Grey Cast Iron

Thread engagements for DBGF

BT = Drill depth
TL = Full thread length



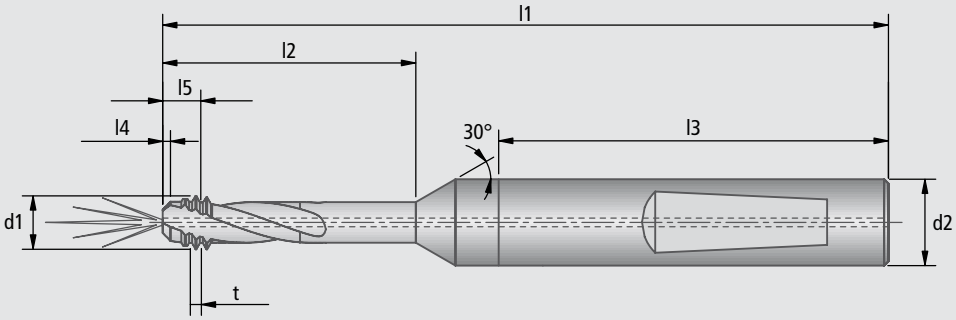
M	2,0×D			3,0×D		
	BT	D3.1	TL	BT	D3.1	TL
M6 / M7	17,8	6,3	14,0	23,8	6,3	20,0
M 8	23,2	8,3	18,5	31,2	8,3	26,5
M 10	28,5	10,3	23,0	38,5	10,3	33,0
M 12	34,0	12,3	27,5	46,0	12,3	39,5

M Direct Circular Drill Thread Milling Tool DBGF

with 3 or 4 cutting edges with front chamfer

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



M-DBGF 2,0×D										TiAlN - HE	TiAlN - HA
Nominal Ø	t	l1	l2	l3	l4	l5	d1	d2	z	Order No.	Order No.
M6 / M7	1,00	60,0	17,8	36	0,4	3,8	4,7	8	3	80752001000018	88752001000018
M 8	1,25	71,0	23,2	40	0,5	4,7	6,3	10	4	80752001000020	88752001000020
M 10	1,50	76,0	28,5	40	0,6	5,5	7,8	10	4	80752001000022	88752001000022
M 12	1,75	86,0	34,0	45	0,6	6,5	9,5	12	4	80752001000024	88752001000024

M-DBGF 3,0×D										TiAlN - HE	TiAlN - HA
Nominal Ø	t	l1	l2	l3	l4	l5	d1	d2	z	Order No.	Order No.
M6 / M7	1,00	65,0	23,8	36	0,4	3,8	4,7	8	3	80758001000018	88758001000018
M 8	1,25	79,0	31,2	40	0,5	4,7	6,3	10	4	80758001000020	88758001000020
M 10	1,50	85,0	38,5	40	0,6	5,5	7,8	10	4	80758001000022	88758001000022
M 12	1,75	100,0	46,0	45	0,6	6,5	9,5	12	4	80758001000024	88758001000024

Thread Milling Tool MKG

Thread milling small threads from M4 upwards

Spiral fluted solid carbide tools with profile correction
Diameter range 4-14 mm
This offers the following main advantages compared to the conventional methods of tapping and roll form tapping

- One and the same tool for different tolerances
- One and the same tool for different diameters >nominal Ø with same pitch

- One and the same tool for blind and through holes
- One and the same tool for different materials
- Exact and repeatable thread depth
- No chip root remaining in the thread
- High speed cutting (HSC) possible

Thread Milling Tool MKG

JEL

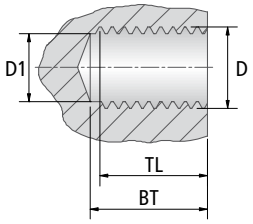
CNC programs can be configured on line at http://tpt.kometgroup.com or can be obtained on request from tel.: +49 (0) 711 78891-0

Thread engagements for MKG

For metric ISO thread DIN 13 and for metric fine ISO thread DIN 13

BT = Drill depth
TL = Full thread length

For safety reasons BT 0.2 deeper than TL



M	1,5×D			2,0×D		
	D1	BT	TL	D1	BT	TL
M4	3,30	6,70	6,50	3,30	8,10	7,90
M5	4,20	7,70	7,50	4,20	10,10	9,90
M6	5,00	9,50	9,30	5,00	12,50	12,30
M8	6,75	13,10	12,90	6,75	16,80	16,60
M10	8,50	15,70	15,50	8,50	20,20	20,00
M12	10,30	18,20	18,00	10,30	25,30	25,10
M14	–	–	–	12,00	28,80	28,60

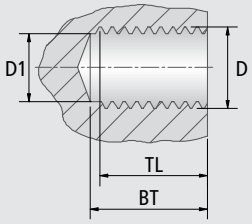
MF	2,0×D		
	D1	BT	TL
M10x1	9,00	20,50	20,30
M12x1,5	10,50	24,70	24,50

Thread engagements for MKG

For UNC thread ANSI B1.1, UNF thread ANSI B1.1 and for Whitworth pipe thread DIN EN ISO 228 and DIN EN 10226 (previously DIN 2999)

BT = Drill depth
TL = Full thread length

For safety reasons BT 0.2 deeper than TL



UNC	2,0×D		
	D1	BT	TL
Nr.10-24 UNC	3,77	10,10	9,90
Nr.12-24 UNC	4,43	11,13	10,93
1/4-20 UNC	5,08	14,60	14,40
5/16-18 UNC	6,53	16,20	16,00
3/8-16 UNC	7,94	19,80	19,60
7/16-14 UNC	9,30	22,60	22,40
1/2-13 UNC	10,75	26,20	26,00
9/16-12 UNC	12,17	30,50	30,30
5/8-11 UNC	13,57	33,27	33,07

UNF	2,0×D		
	D1	BT	TL
Nr.10-32 UNF	4,03	10,00	9,80
Nr.12-28 UNF	4,58	12,30	12,10
1/4-28 UNF	5,44	14,10	13,90
5/16-24 UNF	6,88	16,40	16,20
3/8-24 UNF	8,47	19,60	19,40
7/16-20 UNF	9,84	22,20	22,00
1/2-20 UNF	11,43	26,00	25,80
9/16-18 UNF	12,88	28,90	28,70
5/8-18 UNF	14,46	33,10	32,90

G	2,0×D		
	D1	BT	TL
G1/8-28	8,82	20,40	20,20
G1/4-19	11,82	27,30	27,10
G3/8-19	15,32	35,40	35,20

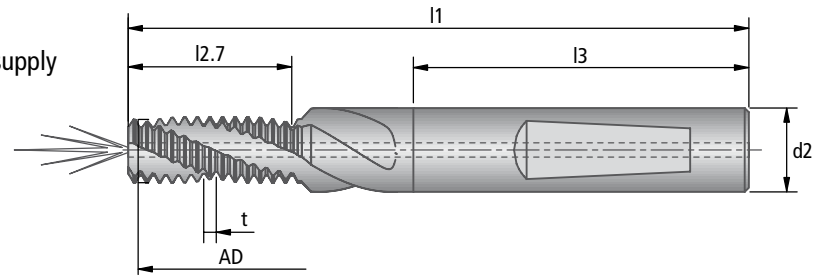
We reserve the right to make technical alterations
Please see note on page 152

M Thread Milling Tool MKG 2.0×D

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide

Note:
For M16: Use MKG M14



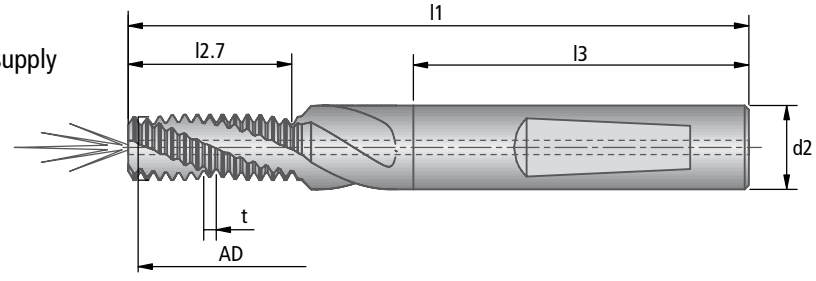
M-MKG 2,0×D									uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	AD	Z	Order No.	Order No.	Order No.	Order No.
M4	0,70	3,30	49,0	8,00	36	6	3,14	3	**80980001000015**	**80983001000015**	**88980001000015**	**88983001000015**
M5	0,80	4,20	49,0	10,00	36	6	3,95	3	**80980001000017**	**80983001000017**	**88980001000017**	**88983001000017**
M6	1,00	5,00	55,0	12,00	36	6	4,68	3	**80980001000018**	**80983001000018**	**88980001000018**	**88983001000018**
M8	1,25	6,75	62,0	16,25	36	8	6,22	3	**80980001000020**	**80983001000020**	**88980001000020**	**88983001000020**
M10	1,50	8,50	74,0	19,50	40	10	7,79	3	**80980001000022**	**80983001000022**	**88980001000022**	**88983001000022**
M12	1,75	10,25	79,0	24,50	45	12	9,38	3	**80980001000024**	**80983001000024**	**88980001000024**	**88983001000024**
M14	2,00	12,00	89,0	28,00	45	14	10,92	4	**80980001000025**	**80983001000025**	**88980001000025**	**88983001000025**

MF Thread Milling Tool MKG 2.0×D

For metric fine ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide

Note:
For M8×1: Use MKG M6
For M12×1: Use MKG M10×1
For M14×1,5: Use MKG M12×1,5
For M16×1,5: Use MKG M12×1,5

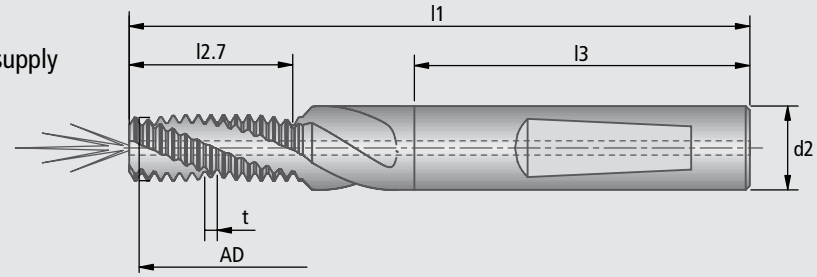


MF-MKG 2,0×D									uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	AD	Z	Order No.	Order No.	Order No.	Order No.
M10x1	1,0	9,0	74,0	20,0	40	10	7,79	3	**80980002000094**	**80983002000094**	**88980002000094**	**88983002000094**
M12x1,5	1,5	10,5	79,0	24,0	45	12	9,38	3	**80980002000113**	**80983002000113**	**88980002000113**	**88983002000113**

UNC Thread Milling Tool MKG 2.0×D

For UNC thread ANSI B1.1
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide

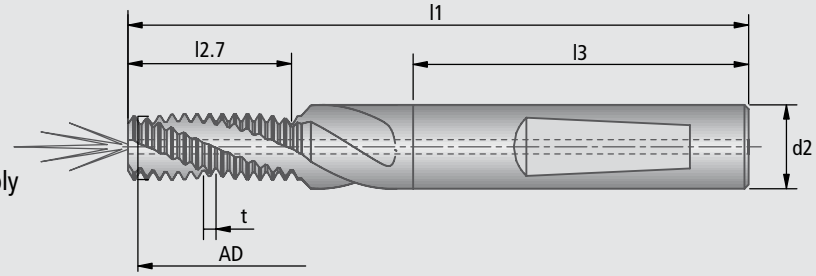


UNC-MKG 2,0×D									uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	AD	Z	Order No.	Order No.	Order No.	Order No.
Nr.10-24 UNC	1,058	3,77	55,0	9,5	36	6	3,68	3	80980010000009	80983010000009	88980010000009	88983010000009
Nr.12-24 UNC	1,058	4,43	55,0	10,6	36	6	4,26	3	80980010000010	80983010000010	88980010000010	88983010000010
1/4-20 UNC	1,270	5,08	55,0	13,9	36	6	4,70	3	80980010000011	80983010000011	88980010000011	88983010000011
5/16-18 UNC	1,411	6,53	62,0	15,5	36	8	6,22	3	80980010000012	80983010000012	88980010000012	88983010000012
3/8-16 UNC	1,588	7,94	74,0	19,1	40	10	7,34	3	80980010000013	80983010000013	88980010000013	88983010000013
7/16-14 UNC	1,814	9,30	79,0	21,8	45	12	8,57	3	80980010000014	80983010000014	88980010000014	88983010000014
1/2-13 UNC	1,954	10,75	79,0	25,4	45	12	9,38	3	80980010000015	80983010000015	88980010000015	88983010000015
9/16-12 UNC	2,117	12,17	89,0	29,6	45	14	10,92	4	80980010000016	80983010000016	88980010000016	88983010000016
5/8-11 UNC	2,309	13,57	102,0	32,3	48	16	12,50	4	80980010000017	80983010000017	88980010000017	88983010000017

UNF Thread Milling Tool MKG 2.0×D

For UNF thread ANSI B1.1
Shank Ø DIN 6535 Form HE/HA

From shank Ø 8 mm with internal coolant supply
Cutting material: solid carbide

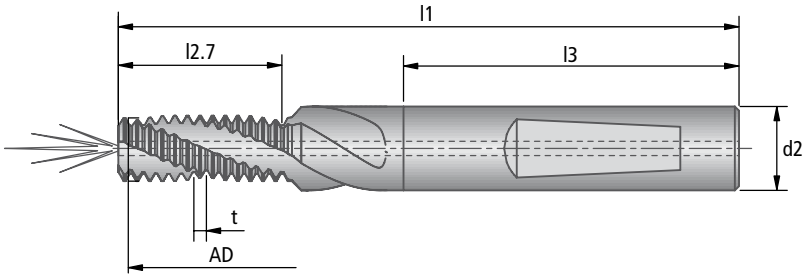


UNF-MKG 2,0×D									uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	AD	Z	Order No.	Order No.	Order No.	Order No.
Nr.10-32 UNF	0,794	4,03	49,0	9,5	36	6	3,95	3	80980011000009	80983011000009	88980011000009	88983011000009
Nr.12-28 UNF	0,907	4,58	55,0	11,8	36	6	4,45	3	80980011000010	80983011000010	88980011000010	88983011000010
1/4-28 UNF	0,907	5,44	55,0	13,6	36	6	4,70	3	80980011000011	80983011000011	88980011000011	88983011000011
5/16-24 UNF	1,058	6,88	62,0	15,9	36	8	6,22	3	80980011000012	80983011000012	88980011000012	88983011000012
3/8-24 UNF	1,058	8,47	74,0	19,0	40	10	7,79	3	80980011000013	80983011000013	88980011000013	88983011000013
7/16-20 UNF	1,270	9,84	79,0	21,6	45	12	7,82	3	80980011000014	80983011000014	88980011000014	88983011000014
1/2-20 UNF	1,270	11,43	79,0	25,4	45	12	9,38	3	80980011000015	80983011000015	88980011000015	88983011000015
9/16-18 UNF	1,411	12,88	89,0	28,2	45	14	10,92	4	80980011000016	80983011000016	88980011000016	88983011000016
5/8-18 UNF	1,411	14,46	102,0	32,4	48	16	12,82	4	80980011000017	80983011000017	88980011000017	88983011000017

G Thread Milling Tool MKG 2.0×D

For Whitworth pipe thread DIN EN ISO 228 and DIN EN 10226 (previously DIN 2999)
Shank Ø DIN 6535 Form HE/HA

From shank Ø 10 mm with internal coolant supply
Cutting material: solid carbide

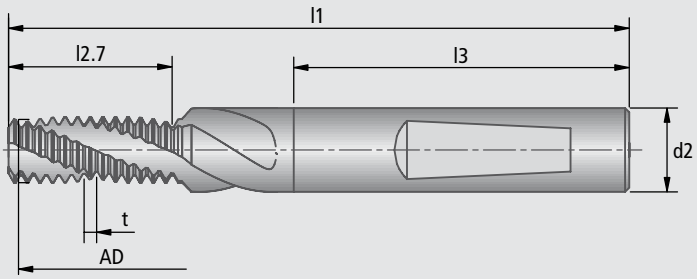


G-MKG 2,0×D									uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	AD	Z	Order No.	Order No.	Order No.	Order No.
G1/8-28	0,907	8,82	74,0	20,0	40	10	7,79	3	**80980025000001**	**80983025000001**	**88980025000001**	**88983025000001**
G1/4-19	1,337	11,82	89,0	26,7	45	14	10,92	4	**80980025000002**	**80983025000002**	**88980025000002**	**88983025000002**
G3/8-19	1,337	15,32	102,0	34,84	48	18	13,92	4	**80980025000003**	**80983025000003**	**88980025000003**	**88983025000003**

M Thread Milling Tool MKG XH 1.5×D

For metric ISO thread DIN 13
For hard machining of materials with hardness ≥45 HRC
Shank Ø DIN 6535 Form HE/HA

Tools without internal coolant supply
Cutting material: solid carbide

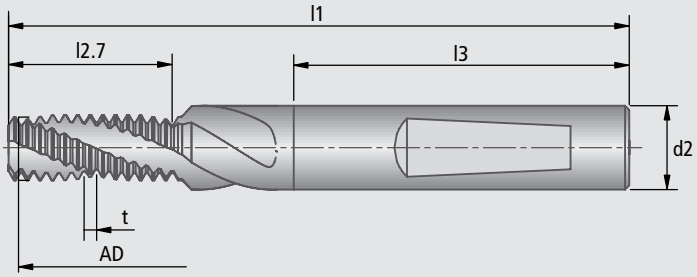


M-MKG XH 1,5×D									TiAlN - HE	TiAlN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	AD	Z	Order No.	Order No.
M4	0,70	3,30	46,0	6,3	36	6	3,14	4	**80987001000015**	**88987001000015**
M5	0,80	4,20	47,0	7,2	36	6	3,95	4	**80987001000017**	**88987001000017**
M6	1,00	5,00	52,0	8,5	36	6	4,68	4	**80987001000018**	**88987001000018**
M8	1,25	6,75	57,0	12,5	36	8	6,22	4	**80987001000020**	**88987001000020**
M10	1,50	8,50	66,0	15,0	40	10	7,79	5	**80987001000022**	**88987001000022**
M12	1,75	10,25	76,0	17,5	45	12	9,38	5	**80987001000024**	**88987001000024**

MF Thread Milling Tool MKG XH 1.5×D

For metric fine ISO thread DIN 13
For hard machining of materials with hardness ≥45 HRC
Shank Ø DIN 6535 Form HE/HA

Tools without internal coolant supply
Cutting material: solid carbide



MF-MKG XH 1,5×D									TiAlN - HE	TiAlN - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	AD	Z	Order No.	Order No.
M12x1,5	1,5	10,5	76,0	17,9	45	12	9,38	5	**80987002000113**	**88987002000113**
M14x1,5	1,5	12,5	82,0	21,4	45	14	10,92	5	**80987002000131**	**88987002000131**
M16x1,5	1,5	14,5	94,0	23,9	48	16	12,82	5	**80987002000147**	**88987002000147**

Thread Milling Tool GWF

Thread milling >Ø20 mm

Spiral fluted solid carbide tools,
some with face cutter and front chamfer

This offers the following main advantages compared to the conventional methods of tapping and roll form tapping:

- One and the same tool for different tolerances
- One and the same tool for different diameters >nominal Ø with same pitch

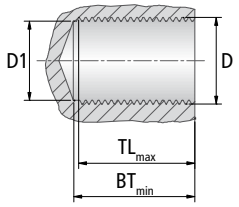
- One and the same tool for blind and through holes
- One and the same tool for different materials
- Exact, repeatable thread depth
- No chip root remaining in the thread
- High speed cutting (HSC) possible

Thread Milling Tool GWF

CNC programs can be configured on line at http://tpt.kometgroup.com or can be obtained on request from tel.: +49 (0) 711 78891-0

Thread engagements for GWF TOMILL SR

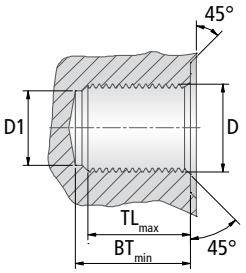
BT = Drill depth
TL = Full thread length



Dimension	Min. drill depth	Thread length on tool	Max. thread length
10×16	TL+min 0,20 mm	16,00	16,00
12×20	TL+min 0,20 mm	20,00	20,00
16×16	TL+min 0,20 mm	16,00	28,00*
16×25	TL+min 0,20 mm	25,00	38,00*
20×20	TL+min 0,20 mm	20,00	38,00*
20×32	TL+min 0,20 mm	32,00	48,00*

* with axial readjustment

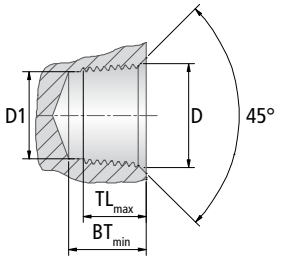
Thread engagements for GWF TOMILL GP



Dimension	Min. drill depth	Thread length on tool	Max. thread length
16×25	TL+1xpitch+0,20 mm	25,00	36,00*
20×32	TL+1xpitch+0,20 mm	32,00	45,00*

* with axial readjustment

Thread engagements for GWF TOMILL GS



For safety reasons BT (boring depth) 0.2 deeper than deepest tool position

Dimension	Dimension	BT	TL
12,5×18,3×14	1/2-14 - 3/4-14NPT	20,20	18,10
19×22,2×11 1/2	1-11 1/2 - 2-11 1/2NPT	24,60	22,10

Dimension	Dimension	BT	TL
12,5×18,3×14	1/2-14 - 3/4-14NPTF	20,20	18,10
19×22,2×11 1/2	1-11 1/2 - 2-11 1/2NPTF	24,60	22,10

Please see note on page 152

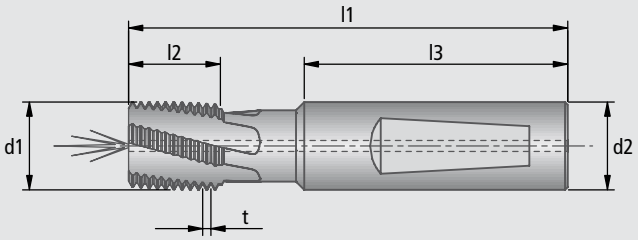
M/MF Thread Milling Tool GWF SR

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide

Where d1 ≤ 12 and 16×25×M3, without neck recess

For thread Ø (d_{min} nut) which is smaller than those shown on this page, please use our MGF or MKG Thread Milling Tools.



M/MF-GWF SR with internal coolant supply							uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
d1×l2×t*	d_{min} Nut	l1	l2	l3	d2	Z	Order No.	Order No.	Order No.	Order No.
10×16×M1	15,0	70,0	16,0	40	10	4	80802002001100	80842002001100	88802002001100	88842002001100
10×16×M1,5	15,0	70,0	16,5	40	10	4	80802002001150	80842002001150	88802002001150	88842002001150
12×20×M1	18,0	80,0	20,0	45	12	4	80802004001100	80842004001100	88802004001100	88842004001100
12×20×M1,5	18,0	80,0	19,5	45	12	4	80802004001150	80842004001150	88802004001150	88842004001150
16×16×M1	24,0	80,0	16,0	48	16	5	80802005001100	80842005001100	88802005001100	88842005001100
16×16×M1,5	24,0	80,0	16,5	48	16	5	80802005001150	80842005001150	88802005001150	88842005001150
16×16×M2	24,0	80,0	16,0	48	16	5	80802005001200	80842005001200	88802005001200	88842005001200
16×25×M1	24,0	90,0	25,0	48	16	5	80802006001100	80842006001100	88802006001100	88842006001100
16×25×M1,5	24,0	90,0	25,5	48	16	5	80802006001150	80842006001150	88802006001150	88842006001150
16×25×M2	24,0	90,0	24,0	48	16	5	80802006001200	80842006001200	88802006001200	88842006001200
16×25×M3	24,0	90,0	27,0	48	16	4	80802006001300	80842006001300	88802006001300	88842006001300
20×20×M1	30,0	92,0	21,0	50	20	5	80802007001100	80842007001100	88802007001100	88842007001100
20×20×M1,5	30,0	92,0	21,0	50	20	5	80802007001150	80842007001150	88802007001150	88842007001150
20×20×M2	30,0	92,0	20,0	50	20	5	80802007001200	80842007001200	88802007001200	88842007001200
20×20×M3	30,0	92,0	21,0	50	20	5	80802007001300	80842007001300	88802007001300	88842007001300
20×32×M1	30,0	105,0	33,0	50	20	5	80802008001100	80842008001100	88802008001100	88842008001100
20×32×M1,5	30,0	105,0	33,0	50	20	5	80802008001150	80842008001150	88802008001150	88842008001150
20×32×M2	30,0	105,0	32,0	50	20	5	80802008001200	80842008001200	88802008001200	88842008001200
20×32×M3	30,0	105,0	33,0	50	20	5	80802008001300	80842008001300	88802008001300	88842008001300

* t= pitch in mm

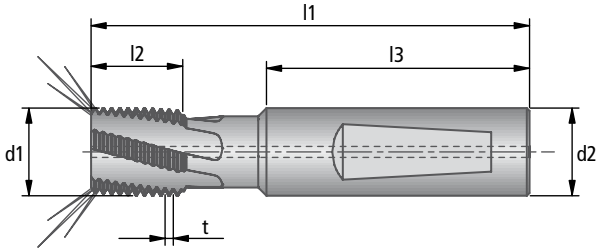
M/MF Thread Milling Tool GWF SR

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with lateral flute coolant supply
Cutting material: solid carbide

Where d1 ≤ 12 and 16×25×M3, without neck recess

For thread Ø (d_{min} nut) which is smaller than those shown on this page, please use our MGF or MKG Thread Milling Tools.



M/MF- GWF SR with lateral flute coolant supply							uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
d1×l2×t*	d_{min} Nut	l1	l2	l3	d2	Z	Order No.	Order No.	Order No.	Order No.
12×20×M1	18,0	80,0	20,0	45	12	4	**80803004001100**	**80843004001100**	**88803004001100**	**88843004001100**
12×20×M1,5	18,0	80,0	19,5	45	12	4	**80803004001150**	**80843004001150**	**88803004001150**	**88843004001150**
16×25×M1	24,0	90,0	25,0	48	16	5	**80803006001100**	**80843006001100**	**88803006001100**	**88843006001100**
16×25×M1,5	24,0	90,0	25,5	48	16	5	**80803006001150**	**80843006001150**	**88803006001150**	**88843006001150**
20×32×M1,5	30,0	105,0	33,0	50	20	5	**80803008001150**	**80843008001150**	**88803008001150**	**88843008001150**
20×32×M2	30,0	105,0	32,0	50	20	5	**80803008001200**	**80843008001200**	**88803008001200**	**88843008001200**

* t= pitch in mm

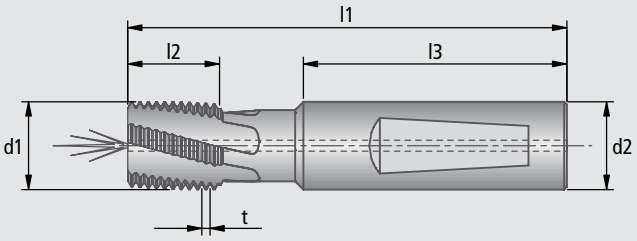
UN Thread Milling Tool GWF SR

For UN thread ANSI B1.1
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide

Where d1 ≤ Ø12, without neck recess

For thread Ø (d_{min} nut) which is smaller than those shown on this page, please use our MGF or MKG Thread Milling Tools.



UN-GWF SR							uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
d1×l2×t*	d_{min} Nut	l1	l2	l3	d2	Z	Order No.	Order No.	Order No.	Order No.
10×16xUN24	15,0	70,0	15,8	40	10	4				
12×20xUN16	18,0	80,0	20,6	45	12	4				
12×20xUN18	18,0	80,0	19,8	45	12	4				
12×20xUN20	18,0	80,0	20,3	45	12	4				
12×20xUN24	18,0	80,0	20,1	45	12	4				
16×16xUN12	24,0	80,0	14,8	48	16	5	80802005001012		88802005001012	
16×16xUN14	24,0	80,0	16,3	48	16	5				
16×16xUN16	24,0	80,0	15,9	48	16	5				
16×16xUN18	24,0	80,0	15,5	48	16	5				
16×16xUN20	24,0	80,0	16,5	48	16	5	80802005001020		88802005001020	
16×16xUN24	24,0	80,0	15,8	48	16	5	80802005001024		88802005001024	
16×25xUN12	24,0	90,0	25,4	48	16	5	80802006001012		88802006001012	
16×25xUN14	24,0	90,0	25,4	48	16	5				
16×25xUN16	24,0	90,0	25,4	48	16	5				
16×25xUN18	24,0	90,0	25,4	48	16	5				
16×25xUN20	24,0	90,0	25,4	48	16	5	80802006001020		88802006001020	
16×25xUN24	24,0	90,0	25,4	48	16	5	80802006001024		88802006001024	
20×20xUN8	30,0	92,0	19,05	50	20	5	80802007001008		88802007001008	
20×20xUN12	30,0	92,0	21,2	50	20	5	80802007001012		88802007001012	
20×20xUN14	30,0	92,0	19,9	50	20	5				
20×20xUN16	30,0	92,0	20,6	50	20	5				
20×20xUN18	30,0	92,0	21,2	50	20	5				
20×20xUN20	30,0	92,0	20,3	50	20	5	80802007001020		88802007001020	
20×20xUN24	30,0	92,0	21,2	50	20	5	80802007001024		88802007001024	
20×32xUN8	30,0	105,0	31,8	50	20	5	80802008001008		88802008001008	
20×32xUN12	30,0	105,0	31,8	50	20	5	80802008001012		88802008001012	
20×32xUN20	30,0	105,0	31,8	50	20	5	80802008001020		88802008001020	

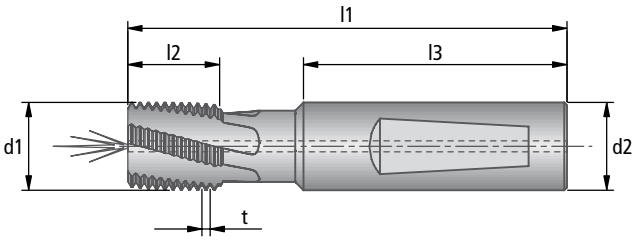
* t= t.p.i.

G Thread Milling Tool GWF SR

For Whitworth pipe thread DIN EN ISO 228
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide

For thread Ø (d_{min} nut) which is smaller than those shown on this page, please use our MGF or MKG Thread Milling Tools.



G-GWF SR							uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
d1×l2×t*	d_{min} Nut	l1	l2	l3	d2	Z	Order No.	Order No.	Order No.	Order No.
16×16xG14	G 1/2"	80,0	16,3	48	16	5				
16×25xG14	G 1/2"	90,0	25,4	48	16	5	**80802006002014**	**80842006002014**	**88802006002014**	**88842006002014**
20×20xG14	G 7/8"	92,0	19,9	50	20	5	**80802007002014**	**80842007002014**	**88802007002014**	**88842007002014**
20×20xG11	G 1"	92,0	20,8	50	20	5	**80802007002011**	**80842007002011**	**88802007002011**	**88842007002011**
20×32xG14	G 7/8"	105,0	32,7	50	20	5	**80802008002014**	**80842008002014**	**88802008002014**	**88842008002014**
20×32xG11	G1"	105,0	32,3	50	20	5	**80802008002011**	**80842008002011**	**88802008002011**	**88842008002011**

* t= t.p.i.

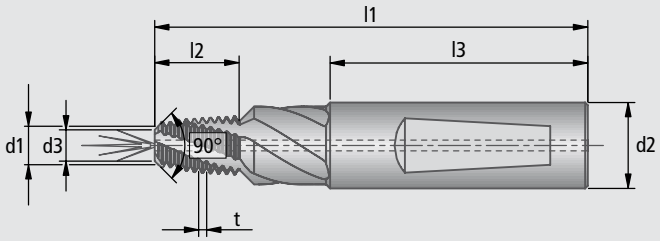
NPT/NPTF Thread Milling Tool GWF GS

For NPT/NPTF thread ANSI B2.1
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide

GWF GS – chamfering and thread milling with one tool

For thread Ø (d_{min} nut) which is smaller than those shown on this page, please use our MGF Thread Milling Tools.



NPT-GWF GS								uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
d1×l2×t*	d_{min} Nut	l1	l2	l3	d2	d3	Z	Order No.	Order No.	Order No.	Order No.
12,5×18,3×14	1/2" - 14	90,0	21,3	48	16	5,30	5	**80872016000005**	**80875016000005**	**88872016000005**	**88875016000005**
19,0×22,2×11 1/2	1" - 11 1/2	92,0	25,5	50	20	10,50	5	**80872016000007**	**80875016000007**	**88872016000007**	**88875016000007**

NPTF-GWF GS								uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
d1×l2×t*	d_{min} Nut	l1	l2	l3	d2	d3	Z	Order No.	Order No.	Order No.	Order No.
12,5×18,3×14	1/2" - 14	90,0	21,3	48	16	5,30	5	**80872017000005**	**80875017000005**	**88872017000005**	**88875017000005**
19,0×22,2×11 1/2	1" - 11 1/2	92,0	25,5	50	20	10,50	5	**80872017000007**	**80875017000007**	**88872017000007**	**88875017000007**

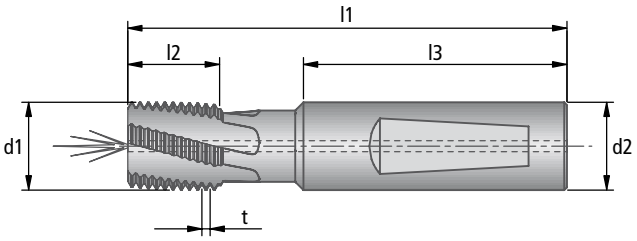
* t= t.p.i.

M/MF Thread Milling Tool GWF SR for external thread

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide

Where d1 ≤ Ø12 without neck recess



M/MF-GWF SR for external thread							uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
d1×l2×t*	d_{min} Nut	l1	l2	l3	d2	Z	Order No.	Order No.	Order No.	Order No.
10×16×M1	15,0	70,0	16,0	40	10	4				
10×16×M1,5	15,0	70,0	16,5	40	10	4				
12×20×M1	18,0	80,0	20,0	45	12	4				
12×20×M1,5	18,0	80,0	19,5	45	12	4				
16×16×M1	24,0	80,0	16,0	48	16	5				
16×16×M1,5	24,0	80,0	16,5	48	16	5				
16×16×M2	24,0	80,0	16,0	48	16	5				
16×25×M1	24,0	90,0	25,0	48	16	5				
16×25×M1,5	24,0	90,0	25,5	48	16	5	**80819006001150**		**88819006001150**	
16×25×M2	24,0	90,0	24,0	48	16	5				
20×20×M1	30,0	92,0	21,0	50	20	5				
20×20×M1,5	30,0	92,0	21,0	50	20	5				
20×20×M2	30,0	92,0	20,0	50	20	5				
20×20×M3	30,0	92,0	21,0	50	20	5				
20×32×M1	30,0	105,0	33,0	50	20	5				
20×32×M1,5	30,0	105,0	33,0	50	20	5	**80819008001150**		**88819008001150**	
20×32×M2	30,0	105,0	32,0	50	20	5				
20×32×M3	30,0	105,0	33,0	50	20	5				

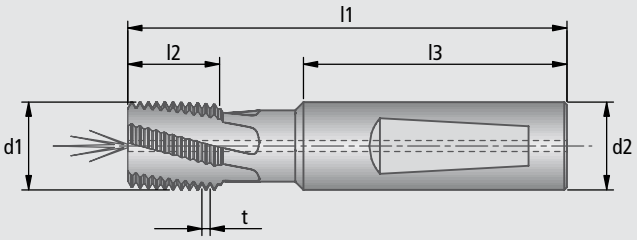
* t= pitch in mm

M/MF Thread Milling Tool GWF XS

For metric ISO thread DIN 13
For steel machining > 900 N/mm²
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide

For thread Ø (d_{min} nut) which is smaller than those shown on this page, please use our MGF XS Thread Milling Tools.



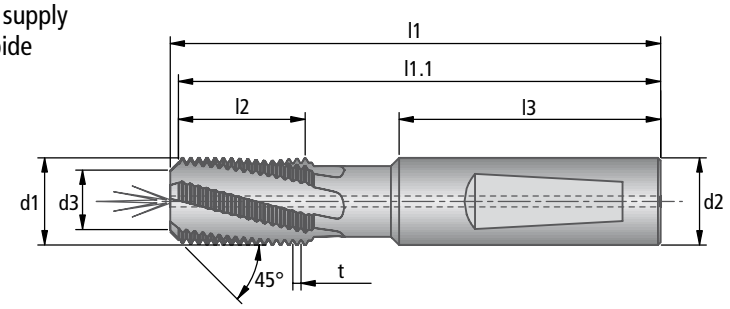
M/MF-GWF XS						TiCN - HE	TiCN - HA
d1×l2×t*	l1	l2	l3	d2	Z	Order No.	Order No.
16×25×M1	90,0	25,0	48	16	4	**80806006001100**	**88806006001100**
16×25×M1,5	90,0	25,5	48	16	4	**80806006001150**	**88806006001150**
20×32×M1,5	105,0	33,0	50	20	4	**80806008001150**	**88806008001150**
20×32×M2	105,0	32,0	50	20	4	**80806008001200**	**88806008001200**
20×32×M3	105,0	33,0	50	20	4	**80806008001300**	**88806008001300**

* t= pitch in mm

M/MF Thread Milling Tool GWF GP

For metric ISO thread DIN 13
Shank Ø DIN 6535 Form HE/HA

Tools with internal coolant supply
Cutting material: solid carbide



M/MF-GWF GP								uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
d1×l2×t*	d_{min} Nut	l1	l2	l3	d2	d3	Z	Order No.	Order No.	Order No.	Order No.
16×25×M1	24,0	90,0	24,0	48	16	12,90	5	**80882006001100**	**80885006001100**	**88882006001100**	**88885006001100**
16×25×M1,5	24,0	90,0	24,0	48	16	11,20	5	**80882006001150**	**80885006001150**	**88882006001150**	**88885006001150**
16×25×M2	24,0	90,0	22,0	48	16	9,60	5	**80882006001200**	**80885006001200**	**88882006001200**	**88885006001200**
20×32×M1	30,0	105,0	32,0	50	20	16,90	5	**80882008001100**	**80885008001100**	**88882008001100**	**88885008001100**
20×32×M1,5	30,0	105,0	31,5	50	20	15,20	5	**80882008001150**	**80885008001150**	**88882008001150**	**88885008001150**
20×32×M2	30,0	105,0	30,0	50	20	13,60	5	**80882008001200**	**80885008001200**	**88882008001200**	**88885008001200**
20×32×M3	30,0	105,0	30,0	50	20	10,50	5	**80882008001300**	**80885008001300**	**88882008001300**	**88885008001300**

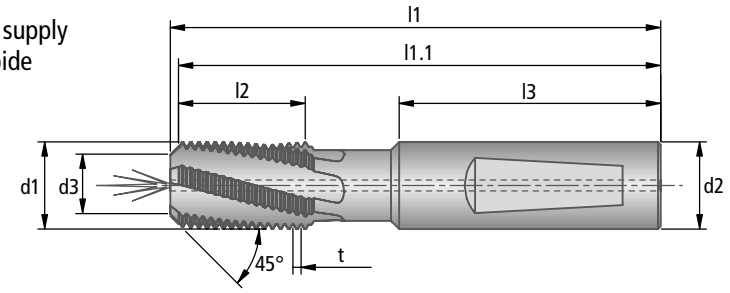
* t= pitch in mm

G Thread Milling Tool GWF GP

For Whitworth pipe thread DIN EN ISO 228
Shank Ø DIN 6535 Form HE/HA

GWF GP – spot facing, chamfering and thread milling with one tool

Tools with internal coolant supply
Cutting material: solid carbide



G-GWF GP								uncoated - HE	TiCN - HE	uncoated - HA	TiCN - HA
d1×l2×t*	d_{min} Nut	l1	l2	l3	d2	d3	Z	Order No.	Order No.	Order No.	Order No.
16×25xG14	G 1/2"	90,0	23,6	48	16	9,80	5	**80882006002014**	**80885006002014**	**88882006002014**	**88885006002014**
20×32xG14	G 7/8"	105,0	30,8	50	20	13,80	5	**80882008002014**	**80885008002014**	**88882008002014**	**88885008002014**
20×32xG11	G 1"	105,0	30,0	50	20	12,20	5	**80882008002011**	**80885008002011**	**88882008002011**	**88885008002011**

* t= t.p.i.

GWF TOMILL Thread Milling Tool

JEL

GWF TOMILL Thread Milling Tool

For manufacturing larger thread diameters under the 2/3 principle, JEL offers the GWF TOMILL without profile correction on the tool.

GWF TOMILL SR

Thread milling down to the bottom of the hole

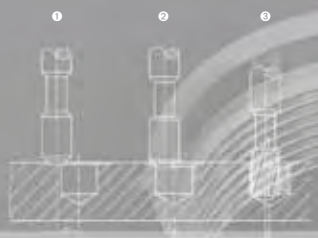
TOMILL SR

GWF TOMILL GP

Using this tool reduces machining time enormously. Spot facing, chamfering and thread milling with a single tool.

TOMILL GP

Machining sequence



❶ Circular spot face milling
❷ Circular chamfering
❸ Thread milling

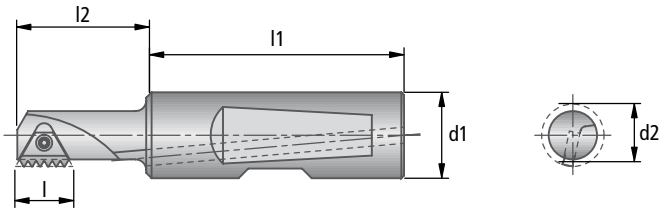
GWF TOMILL GS

Spot facing and thread milling in one set-up.
For NPT and NPTF threads.

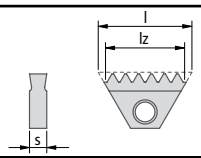
GWF TOMILL GS

Thread Milling Tool with internal coolant supply with carbide inserts

Tool holder with internal coolant supply



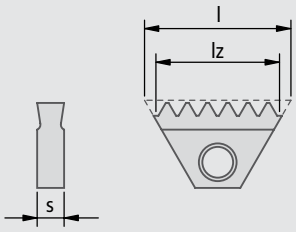
Holder size code no.	Dimensions							
	d 2	d 1	l	l 1	l 2	l 3	Appropriate insert size	Order No.
11.11	12,00	16,0	11,0	48,0	22,0	70,0	10.03	**50987000001111**
15.16	16,00	20,0	16,0	50,0	32,0	82,0	16.T3	**50987000001516**
20.22	21,10	25,0	22,0	56,0	44,0	100,0	22.04	**50987000002022**
25.27	26,30	25,0	27,0	60,0	54,0	114,0	27.06	**50987000002527**

XAM		10.03		uncoated	TiN	16.T3		uncoated	TiN
		z	lz	Order No.	Order No.	z	lz	Order No.	Order No.
Insert size		**10.03**				**16.T3**			
lxs (mm)		10×3,18				16×3,97			
Appropriate holder		11.11				15.16			
Lower milling limit for internal thread		16 mm 5/8" G 3/8"				22 mm 7/8" G 1/2"			
Metric ISO thread DIN 13 pitch (No. of milling teeth)									
	1,00	9	9,00	**50111002000111**	**50115002000111**	15	15,0	**50161002000111**	**50165002000111**
	1,25	7	8,75	**50111002000112**	**50115002000112**				
	1,50	5	7,50	**50111002000113**	**50115002000113**	10	15,0	**50161002000113**	**50165002000113**
	2,00					7	14,0	**50161002000115**	**50165002000115**
	2,50								
	3,00								
American UN thread pitch (No. of milling teeth)									
	24	8	8,46	**50111010000009**					
	20					11	13,97	**50161010000012**	
	16	5	7,94			9	14,29		
	12					6	12,70	**50161010000017**	
	8								
Whitworth pipe thread * DIN EN ISO 228 pitch (No. of milling teeth)									
	19	6	8,02	**50111025000002**					
	14	8	14,51	**50161025000003**					
	11								
American NPT thread pitch (No. of milling teeth)									
	14					8	14,51		
	11 1/2								
American NPTF thread pitch (No. of milling teeth)									
	14					8	14,51		
	11 1/2								

* For Whitworth pipe thread the insert can be used both for internal and for external thread.

Carbide inserts

Type XAM for internal thread

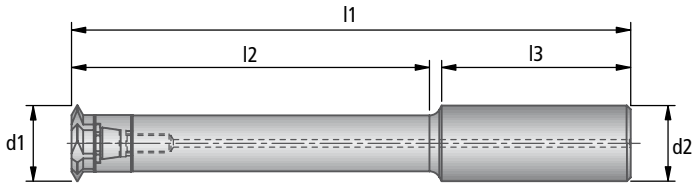


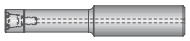
XAM		22.04		uncoated	TiN	27.06		uncoated	TiN
		z	lz	Order No.	Order No.	z	lz	Order No.	Order No.
Insert size		**22.04**				**27.06**			
lxs (mm)		22x4,76				27x6,35			
Appropriate holder		20.22				25.27			
Lower milling limit for internal thread		28 mm				36 mm			
		1.1/8"				1.1/2"			
		G 1"				G 1.1/8"			
Metric ISO thread DIN 13 pitch (No. of milling teeth)									
	1,00	21	21,0	**50221002000111**	**50225002000111**				
	1,25								
	1,50	13	19,5	**50221002000113**	**50225002000113**	17	25,5	**50271002000113**	**50275002000113**
	2,00	10	20,0	**50221002000115**	**50225002000115**	12	24,0	**50271002000115**	**50275002000115**
	2,50								
	3,00	6	18,0		**50225002000117**	8	24,0		
American UN thread pitch (No. of milling teeth)									
	24								
	20								
	16								
	12								
	8	5	18,88	**50221010000021**	**50225010000021**	7	22,23	**50271010000021**	**50275010000021**
Whitworth pipe thread * DIN EN ISO 228 pitch (No. of milling teeth)									
	19								
	14								
	11	8	18,47	**50221025000004**	**50225025000004**	10	23,09	**50271025000004**	**50275025000004**
American NPT thread pitch (No. of milling teeth)									
	14	11	19,95						
	11 1/2					11	24,29		
American NPTF thread pitch (No. of milling teeth)									
	14	11	19,95						
	11 1/2					11	24,29		

JEL Thread Milling Tools TOMILL CUT - for Thread milling > Ø 20

Advantages:

- **5 basic holders with 7 thread milling heads for pitch 1,0-6,0mm, as well as UN22-UN4 T.P.I and G 14-G 11 T.P.I**
- **For metric- and metric fine ISO threads from M20x1, as well as 13/16" and G 1/2**
- **Thread lengths up to 96mm can be produced**
- **CNC programs can be configured online**



GWF CUT H - Holder							GWF CUT K - Thread milling head					
												
Order No. Article	**l1**	**l2**	**l3**	**d1**	**d2**	**z**	Size screw	**Order No.** Article	**Order No.** Article	**Order No.** Article	**Order No.** Article	**d_{min} nut**
58310016001050 GWF CUT H 16x50	100	50	48	16	16	6	**Größe 1** **5502104020** M4x20 DIN 7991	**50341001001020** GWF CUT K M1,0-2,0 TiAlN H16 UN24-UN12	**50341001001525** GWF CUT K M1,5-2,5 TiAlN H16 UN18-UN10	**50341001251400** GWF CUT K G14 TiAlN H16	**50341001251100** GWF CUT K G11 TiAlN H16	20 mm 13/16-20UNEF G1/2
58310016001080 GWF CUT H 16x80	130	80	48	16	16	6						
58310020002060 GWF CUT H 20x60	112	60	50	20	20	6	**Größe 2** **5502105025** M5x25 DIN 7991	**50341002001020** GWF CUT K M1,0-2,0 TiAlN H20 UN24-UN12	**50341002003040** GWF CUT K M3,0-4,0 TiAlN H20 UN8-UN6			24 mm 1-8UNC
58310020002096 GWF CUT H 20x96	148	96	50	20	20	6						
58310025004136 GWF CUT H 25x136	197	136	56	34	25	6	**Größe 4** **5502108035** M8x35 DIN 7991	**50341004005060** GWF CUT K M5,0-6,0 TiAlN H25 UN5-UN4				48 mm 1-3/4-5UNC

Supply includes: Holder with screw

CNC programs can be configured on line at http://tpt.kometgroup.com or can be obtained on request from tel.: +49 (0) 711 78891-0

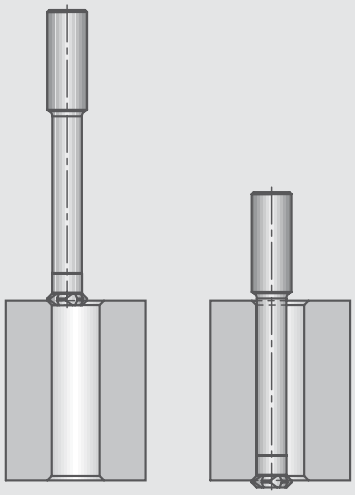
JEL Thread Milling Cutter TOMILL CUT KF for 90°-chamfering and deburring

Carbide chamfer head,
TiAlN coated:

90°-chamfering of the bore top as well as the bore exit.

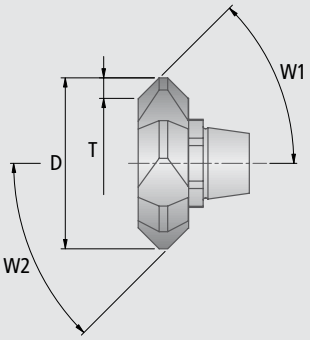
Deburring of workpiece edges.

Chamfer heads with other angle (combinations) are available on request.



GWF CUT H - Holder								GWF CUT KF - Chamfering head	
Order No. Article	l1	l2	l3	d1	d2	z	Size screw	Order No. Article	d_{min} bore
58310016001050 GWF CUT H 16x50	100	50	48	16	16	6	**Size 1** **5502104020** M4x20 DIN 7991	**50391045011600** GWF CUT KF D16 - 45°/45° TiAlN H16	16,5
58310016001080 GWF CUT H 16x80	130	80	48	16	16	6			
58310020002060 GWF CUT H 20x60	112	60	50	20	20	6	**Size 2** **5502105025** M5x25 DIN 799	**50391045022000** GWF CUT KF D20 - 45°/45° TiAlN H20	20,5
58310020002096 GWF CUT H 20x96	148	96	50	20	20	6			
58310025004136 GWF CUT H 25x136	197	136	56	34	25	6	**Size 4** **5502108035** M8x35 DIN 7991	**50391045043400** GWF CUT KF D34 - 45°/45° TiAlN H25	34,5

Supply includes: Holder with screw



GWF CUT KF Angles and infeeds			
D	T	W1	W2
16	1,4	45°	45°
20	2,4	45°	45°
34 [1]	3,5	45°	45°

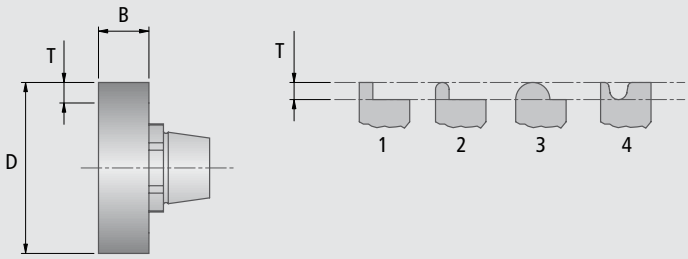
1) Cylindrical connection

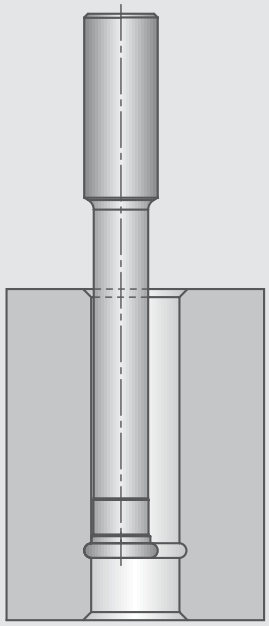
JEL Thread Milling Cutter TOMILL CUT KE for grooving

Grooving heads in various designs are available on request.

Solid carbide or PCD tipped.

Examples of possible designs:





GWF CUT H - Holder								GWF CUT KE – max. infeeds			
Order No. Article	l1	l2	l3	d1	d2	z	Size screw	D_{max}	B_{max}	T_{max}	d_{min} bore
58310016001050 GWF CUT H 16x50	100	50	48	16	16	6	**Größe 1** **5502104020** M4x20 DIN 7991	16	4,5	1,4	16,5
58310016001080 GWF CUT H 16x80	130	80	48	16	16	6					
58310020002060 GWF CUT H 20x60	112	60	50	20	20	6	**Größe 2** **5502105025** M5x25 DIN 799	20	5,5	2,4	20,5
58310020002096 GWF CUT H 20x96	148	96	50	20	20	6					
58310025004136 GWF CUT H 25x136	197	136	56	34	25	6	**Größe 4** **5502108035** M8x35 DIN 7991	34 [1]	9,5	3,5	34,5

Supply includes: Holder with screw

1) Cylindrical connection

PCD Tools

Modern PCD cutting material

is suitable for cutting lightweight structural materials such as aluminium, magnesium and fibre-reinforced plastics.

We have already successfully introduced a variety of special solutions.

Due to high hardness and resistance to abrasion, polycrystalline diamond (PCD) cutting materials have achieved significant importance in machining aluminium alloys.

With our PCD tipped cutting tools we will take your machine to its full potential at maximum productivity.

Depending on the application there is almost unlimited cutting speed possible.

It is no longer the tool which determines the cutting data but the efficiency of your machine.

PCD Tools

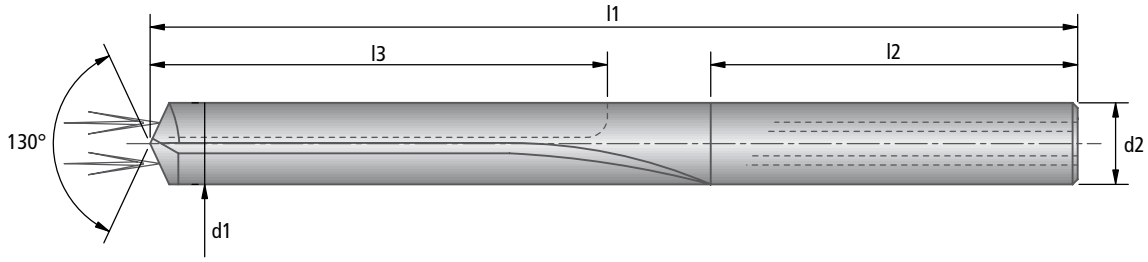
CNC programs can be configured on line at http://tpt.kometgroup.com or can be obtained on request from tel.: +49 (0) 711 78891-0

DRILLCUT 24

PCD High Performance Drill, boring depth up to 5×D

with solid carbide shank, 2 cutting edges and 4 guides,
straight fluted, with coolant channels

Shank Ø DIN 6535 Form HA



DRILLCUT 24 - 5xD						
d1	**for thread**	**l1**	**l2**	**l3**	**d2**	 **Order No.**
5,00	M6	82	36	35	6	**38588082000500**
5,50	M6 roll formed + M6×0,5	82	36	35	6	**38588082000550**
6,00		82	36	35	6	**38588082000600**
6,80	M8	91	36	43	8	**38588091000680**
7,40	M8 roll formed	91	36	43	8	**38588091000740**
8,00		91	36	43	8	**38588091000800**
8,50	M10	103	40	49	10	**38588003000850**
9,30	M10×1,25 roll formed	103	40	49	10	**38588003000930**
10,00		103	40	49	10	**38588003001000**
10,20	M12	118	45	56	12	**38588018001020**
11,20	M12×1,5 roll formed	118	45	56	12	**38588018001120**
12,00	M14	118	45	56	12	**38588018001200**

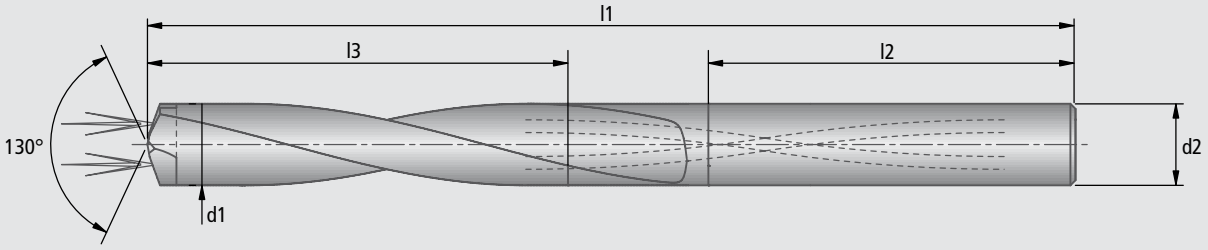
Cutting material: PCD sandwich

DRILLMAX 22

PCD High Performance Drill, boring depth up to 5×D

with solid carbide shank, 2 cutting edges and 2 guides, spiral fluted,
with coolant channels

Shank Ø DIN 6535 Form HA



DRILLMAX 22 - 5xD					
d1	**l1**	**l2**	**l3**	**d2**	**Order No.**
6,00	82	36	30	6	**38405002000600**
8,00	91	36	42	8	**38405002000800**
10,00	103	40	50	10	**38405002001000**

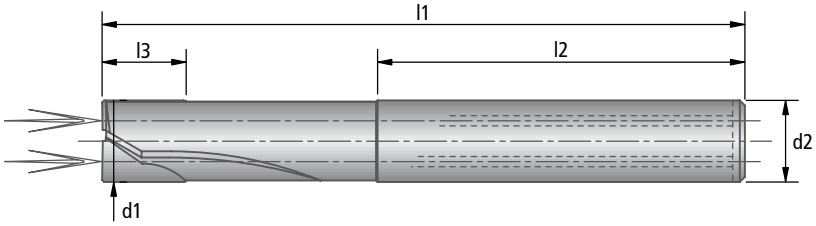
Cutting material: PCD sandwich

PCD Drill Slot Milling Tool

1×D with solid carbide shank

Drilling/milling depth up to 1×D,
with coolant channels

Shank Ø DIN 6535 Form HA

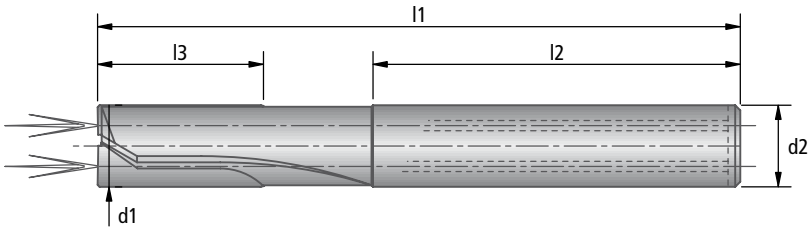


2 cutting edges, 1 cutting edge over centre, straight fluted					
d1	**l1**	**l2**	**l3**	**d2**	**Order No.**
6	57	36	6	6	**38390000000600**
8	63	36	8	8	**38390000000800**
10	72	40	10	10	**38390000001000**
12	83	45	12	12	**38390000001200**
3 cutting edges, 1 cutting edge over centre, straight fluted					
16	90	48	16	16	**38391000001600**
20	104	50	20	20	**38391000002000**

2×D with solid carbide shank

Drilling /milling depth up to 2×D,
with coolant channels

Shank Ø DIN 6535 Form HA



2 cutting edges, 1 cutting edge over centre, straight fluted					
d1	**l1**	**l2**	**l3**	**d2**	**Order No.**
6	57	36	12	6	**38392057000600**
8	63	36	16	8	**38392063000800**
10	72	40	20	10	**38392072001000**
12	83	45	24	12	**38392083001200**
3 cutting edges, 1 cutting edge over centre, straight fluted					
16	90	48	32	16	**38393090001600**
20	104	50	40	20	**38393004002000**

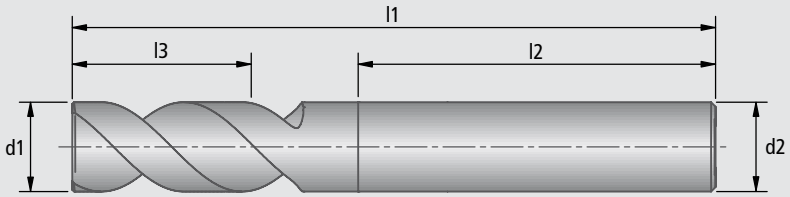
Cutting material: PCD

End mill HF

2xD, 2 cutting edges, face cutting, spiral flutet

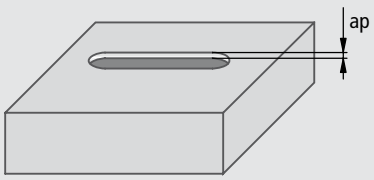
Drilling/milling depth up to 2×D,
without coolant channels

Shank Ø DIN 6535 Form HA
Cutting material: solid carbide

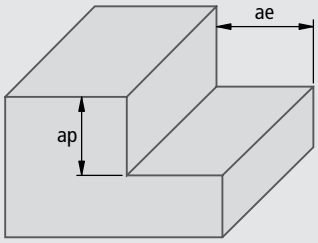


2xD, 2 cutting edges, face cutting, spiral flutet					DLC - HA
d1	l1	l2	l3	d2	Order No.
6	57	36	12	6	**78931057000600**
8	63	36	16	8	**78931063000800**
10	72	40	20	10	**78931072001000**
12	83	45	24	12	**78931083001200**

Cutting material: solid carbide



ap = max. 1 x D



ap = max. 2 x D
ae = max. 0,5 x D

Cutting values see page 157

M Thread Milling Tool PCD–MGF

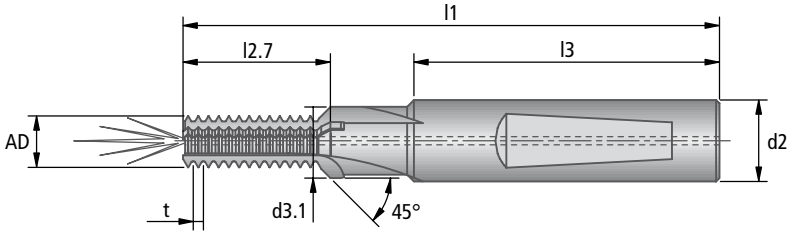
with solid carbide shank

With rear chamfer for metric ISO thread DIN 13

Shank Ø DIN 6535 Form HE/HA
Tools with internal coolant supply

We can supply thread milling tools for other fixed thread lengths on request.

Thread engagements see page 16



M-PCD-MGF 2,0×D										PCD - HE	PCD - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3.1	AD	Z	Order No.	Order No.
M 8	1,25	6,8	74	17,8	40	10	8,3	6,22	2	**30970001000020**	**38970001000020**
M10	1,50	8,5	79	21,4	45	12	10,3	7,79	3	**30970001000022**	**38970001000022**
M12	1,75	10,2	89	26,7	45	14	12,3	9,38	3	**30970001000024**	**38970001000024**

MF Thread Milling Tool PCD–MGF

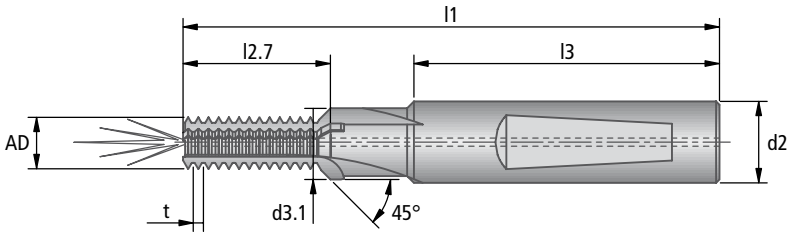
with solid carbide shank

With rear chamfer for metric fine ISO thread DIN 13

Shank Ø DIN 6535 Form HE/HA
Tools with internal coolant supply

We can supply thread milling tools for other fixed thread lengths on request.

Thread engagements see page 16



MF-PCD-MGF 2,0×D										PCD - HE	PCD - HA
Nominal Ø	t	Drill Ø	l1	l2.7	l3	d2	d3.1	AD	Z	Order No.	Order No.
M10x1	1,00	9,0	79	21,5	45	12	10,3	7,79	3	**30970002000094**	**38970002000094**
M12x1,5	1,50	10,5	88	26,0	45	14	12,3	9,38	3	**30970002000113**	**38970002000113**

Cutting material: PCD

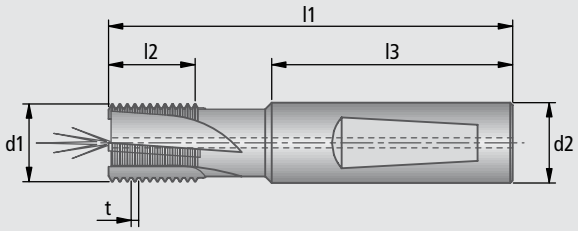
M/MF Thread Milling Tool PCD–GWF SR

with solid carbide shank

For metric ISO thread DIN 13

Shank Ø DIN 6535 Form HE/HA
Tools with internal coolant supply

Thread engagements see page 70



PCD-GWF SR							PCD - HE	PCD - HA
d1xl2xt	d_{min} Nut	l1	l2	l3	d2	Z	Order No.	Order No.
16x16x1,5	24	80	16,5	48	16	4	**30802005001150**	**38802005001150**
20x20x1,5	30	92	19,5	50	20	4	**30802007001150**	**38802007001150**

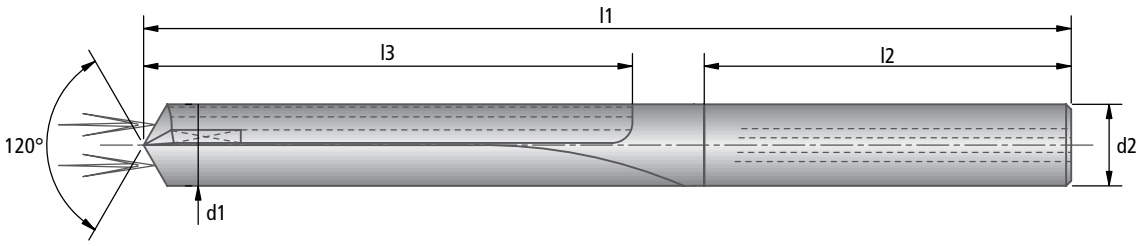
Cutting material: PCD

DREAMMAX Drill Reamer

for bore tolerance H7, drill depth up to 4×D

with 2 cutting edges, straight fluted, with coolant channels

Shank Ø DIN 6535 Form HA



DREAMMAX - 4xD					TiN - HA
d 1	l 1	l 2	l 3	d 2	Order No.
6,00	82	36	24	6	**78451082000600**
8,00	91	36	32	8	**78451091000800**
10,00	103	40	40	10	**78451003001000**
12,00	118	45	48	12	**78451018001200**

Cutting material: solid carbide

PCD Tools

for maximum cutting speeds and tool life

DRILLCUT 24

PCD high performance drill,
drill depth up to 5×D

DRILLMAX 22

PCD high performance drill,
drill depth up to 5×D

Thread Milling Tool PCD–MGF

with solid carbide shank

Thread Milling Tool PCD–GWF SR

with solid carbide shank

PCD Drill Slot Milling Tool

2×D with solid carbide shank, 2 cutting edges
1 cutting edge over centre, straight fluted
from Ø 16 with 3 cutting edges

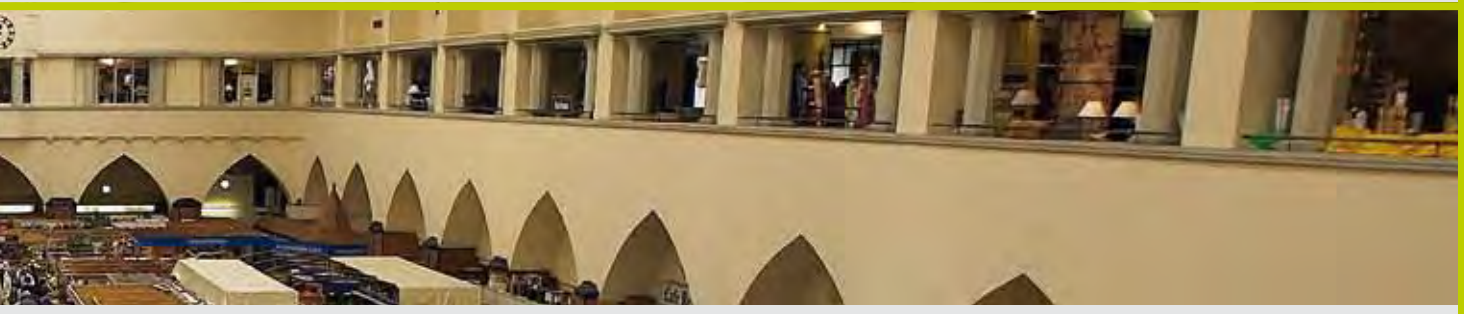
Taps

HSS-E taps can be used universally for almost all materials. For heavy duty requirements we offer types in HSS-E powder metal grades (PM). Solid carbide taps are made out of a special extra fine grain.
These tools are specifically for machining high silicon aluminium alloys, brittle materials, such as grey cast iron or short chipping brass and heavy-duty materials.

Compared to HSS-E taps carbide taps have substantial advantages:

- Up to 20x longer tool life than HSS-E taps
- Fewer tool change times due to longer tool life
- Higher cutting speeds - so shorter cycle times
- Significant reduction in production costs due to longer tool life, higher cutting speeds and fewer tool changes

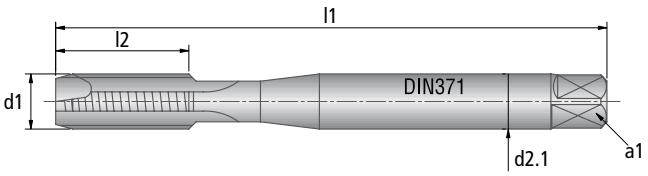
Taps

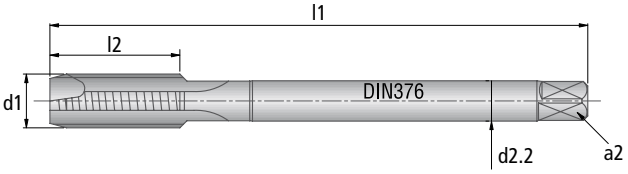


M HSS-E Taps

DOREX, DOREX VAV, DOREX TiN, DOREX TiCN, TINIB, FEDUB

For metric ISO thread DIN 13
Cutting material: HSS-E / PM
* up to and including M6 without neck



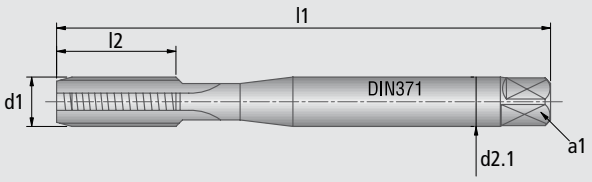


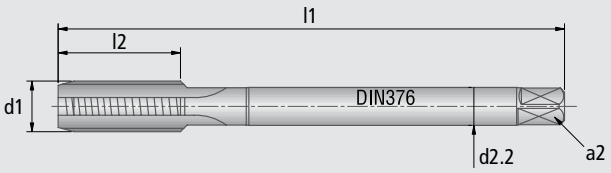
Type								DOREX	DOREX VAV	DOREX TiN	DOREX TiCN	TINIB	FEDUB
Tolerance field								ISO 2	ISO 2	ISO 2	ISO 2	ISO 2	ISO 2
Dimensions (DIN)								371 to M10	371 to M10	371 to M10	371 to M10	371 to M10 *	371 to M10 *
								376 from M11	376 from M11	376 from M11	376 from M11	376 from M11	376 from M11
Material								HSS-E	HSS-E	HSS-E	HSS - E	PM	PM
Chamfer form								B	B	B	B	B	B
Version								uncoated	vaporized	TiN	TiCN	vaporized	vaporized
Nominal Ø d1	P	l1	l2	d2.1	a1	d2.2	a2	Order No.	Order No.	Order No.	Order No.	Order No.	Order No.
M 1,4	0,30	40	7,0	2,5	2,1								
M 1,6	0,35	40	8,0	2,5	2,1			**20122001000005**	**20136001000005**				
M 1,7	0,35	40	8,0	2,5	2,1								
M 1,8	0,35	40	8,0	2,5	2,1								
M 2	0,40	45	8,0	2,8	2,1			**20122001000008**	**20136001000008**			**20194001000008**	
M 2,2	0,45	45	9,0	2,8	2,1								
M 2,3	0,40	45	9,0	2,8	2,1								
M 2,5	0,45	50	9,0	2,8	2,1			**20122001000011**	**20136001000011**			**20194001000011**	
M 2,6	0,45	50	9,0	2,8	2,1								
M 3	0,50	56	11,0	3,5	2,7			**20122001000013**	**20136001000013**	**20322001000013**	**20622001000013**	**20194001000013**	**20186001000013**
M 3,5	0,60	56	13,0	4,0	3,0								
M 4	0,70	63	13,0	4,5	3,4			**20122001000015**	**20136001000015**	**20322001000015**	**20622001000015**	**20194001000015**	**20186001000015**
M 4,5	0,75	70	15,0	6,0	4,9								
M 5	0,80	70	16,0	6,0	4,9			**20122001000017**	**20136001000017**	**20322001000017**	**20622001000017**	**20194001000017**	**20186001000017**
M 6	1,00	80	18,0	6,0	4,9			**20122001000018**	**20136001000018**	**20322001000018**	**20622001000018**	**20194001000018**	**20186001000018**
M 7	1,00	80	18,0	7,0	5,5			**20122001000019**					
M 8	1,25	90	18,0	8,0	6,2			**20122001000020**	**20136001000020**	**20322001000020**	**20622001000020**	**20194001000020**	**20186001000020**
M 9	1,25	90	18,0	9,0	7,0								
M10	1,50	100	21,0	10,0	8,0			**20122001000022**	**20136001000022**	**20322001000022**	**20622001000022**	**20194001000022**	**20186001000022**
M11	1,50	100	21,0			8,0	6,2						
M12	1,75	110	24,0			9,0	7,0	**20123001000024**	**20137001000024**	**20323001000024**	**20623001000024**		**20187001000024**
M14	2,00	110	24,0			11,0	9,0	**20123001000025**	**20137001000025**				
M16	2,00	110	27,0			12,0	9,0	**20123001000026**	**20137001000026**				
M18	2,50	125	32,0			14,0	11,0	**20123001000027**	**20137001000027**				
M20	2,50	140	32,0			16,0	12,0	**20123001000028**	**20137001000028**				
M22	2,50	140	32,0			18,0	14,5	**20123001000029**					
M24	3,00	160	38,0			18,0	14,5	**20123001000030**					
M27	3,00	160	38,0			20,0	16,0						
M30	3,50	180	42,0			22,0	18,0						

M HSS-E Taps

GG, GG TiN, SIREX

For metric ISO thread DIN 13
Cutting material: HSS-E
* up to and including M6 without neck



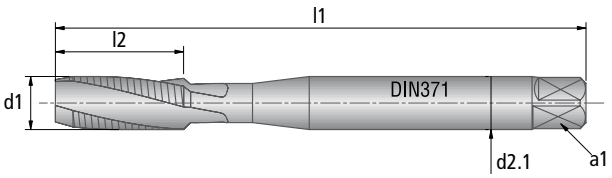


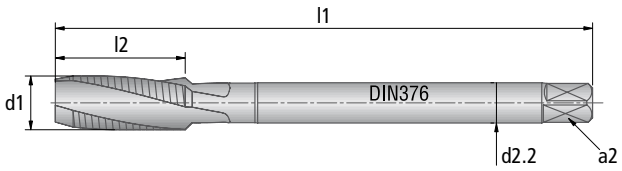
Type								GG	GG TiN	SIREX
Tolerance field								ISO 2X	ISO 2X	ISO 2
Dimensions (DIN)								371 to M10	371 to M10	371 to M10
								376 from M11	376 from M11	376 from M11
Material								HSS - E	HSS - E	HSS - E
Chamfer form								C	C	C
Version								nitrided	TiN	uncoated
Nominal Ø d1	P	l1	l2	d2.1	a1	d2.2	a2	Order No.	Order No.	Order No.
M 1,4	0,30	40	7,0	2,5	2,1					
M 1,6	0,35	40	8,0	2,5	2,1					
M 1,7	0,35	40	8,0	2,5	2,1					
M 1,8	0,35	40	8,0	2,5	2,1					
M 2	0,40	45	8,0	2,8	2,1					20120001000008
M 2,2	0,45	45	9,0	2,8	2,1					
M 2,3	0,40	45	9,0	2,8	2,1					
M 2,5	0,45	50	9,0	2,8	2,1					20120001000011
M 2,6	0,45	50	9,0	2,8	2,1					
M 3	0,50	56	11,0	3,5	2,7				20356001000013	20120001000013
M 3,5	0,60	56	13,0	4,0	3,0					20120001000014
M 4	0,70	63	13,0	4,5	3,4			20156001000015	20356001000015	20120001000015
M 4,5	0,75	70	15,0	6,0	4,9					
M 5	0,80	70	16,0	6,0	4,9			20156001000017	20356001000017	20120001000017
M 6	1,00	80	18,0	6,0	4,9			20156001000018	20356001000018	20120001000018
M 7	1,00	80	18,0	7,0	5,5					
M 8	1,25	90	18,0	8,0	6,2			20156001000020	20356001000020	20120001000020
M 9	1,25	90	18,0	9,0	7,0					
M10	1,50	100	21,0	10,0	8,0			20156001000022	20356001000022	20120001000022
M11	1,50	100	21,0			8,0	6,2			
M12	1,75	110	24,0			9,0	7,0	20157001000024	20357001000024	20121001000024
M14	2,00	110	24,0			11,0	9,0	20157001000025		20121001000025
M16	2,00	110	27,0			12,0	9,0	20157001000026		20121001000026
M18	2,50	125	32,0			14,0	11,0	20157001000027		
M20	2,50	140	32,0			16,0	12,0	20157001000028		
M22	2,50	140	32,0			18,0	14,5			
M24	3,00	160	38,0			18,0	14,5			
M27	3,00	160	38,0			20,0	16,0			
M30	3,50	180	42,0			22,0	18,0			

M HSS-E Taps

SIREX SR, TINIC, FEDUC

For metric ISO thread DIN 13
Cutting material: HSS-E / PM
* up to and including M6 without neck



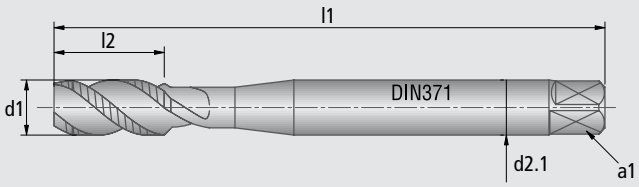


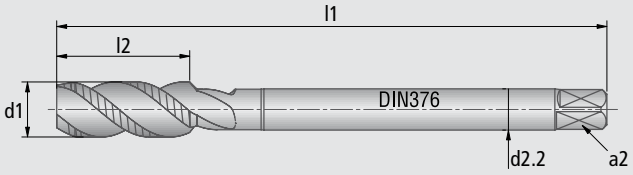
Type								SIREX SR	TINIC	FEDUC
Tolerance field								ISO 2	ISO 2	ISO 2
Dimensions (DIN)								371 to M10	371 to M10 *	371 to M10 *
								376 from M11	376 from M11	376 from M11
Material								HSS - E	PM	PM
Chamfer form								C	C	C
Version								uncoated	vaporized	vaporized
Nominal Ø d1	P	l1	l2	d2.1	a1	d2.2	a2	Order No.	Order No.	Order No.
M 1,4	0,30	40	7,0	2,5	2,1					
M 1,6	0,35	40	8,0	2,5	2,1					
M 1,7	0,35	40	8,0	2,5	2,1					
M 1,8	0,35	40	8,0	2,5	2,1					
M 2	0,40	45	8,0	2,8	2,1			**20144001000008**	**20190001000008**	**20192001000008**
M 2,2	0,45	45	9,0	2,8	2,1					
M 2,3	0,40	45	9,0	2,8	2,1					
M 2,5	0,45	50	9,0	2,8	2,1			**20144001000011**	**20190001000011**	**20192001000011**
M 2,6	0,45	50	9,0	2,8	2,1					
M 3	0,50	56	11,0	3,5	2,7			**20144001000013**	**20190001000013**	**20192001000013**
M 3,5	0,60	56	13,0	4,0	3,0			**20144001000014**		
M 4	0,70	63	13,0	4,5	3,4			**20144001000015**	**20190001000015**	**20192001000015**
M 4,5	0,75	70	15,0	6,0	4,9					
M 5	0,80	70	16,0	6,0	4,9			**20144001000017**	**20190001000017**	**20192001000017**
M 6	1,00	80	18,0	6,0	4,9			**20144001000018**	**20190001000018**	**20192001000018**
M 7	1,00	80	18,0	7,0	5,5					
M 8	1,25	90	18,0	8,0	6,2			**20144001000020**	**20190001000020**	**20192001000020**
M 9	1,25	90	18,0	9,0	7,0					
M10	1,50	100	21,0	10,0	8,0			**20144001000022**	**20190001000022**	**20192001000022**
M11	1,50	100	21,0			8,0	6,2			
M12	1,75	110	24,0			9,0	7,0	**20145001000024**	**20191001000024**	**20193001000024**
M14	2,00	110	24,0			11,0	9,0	**20145001000025**		
M16	2,00	110	27,0			12,0	9,0	**20145001000026**		
M18	2,50	125	32,0			14,0	11,0	**20145001000027**		
M20	2,50	140	32,0			16,0	12,0	**20145001000028**		
M22	2,50	140	32,0			18,0	14,5			
M24	3,00	160	38,0			18,0	14,5			
M27	3,00	160	38,0			20,0	16,0			
M30	3,50	180	42,0			22,0	18,0			

M HSS-E Taps

TAREX, TAREX VAV, TAREX TiN, TAREX TiCN, TAREX OT TiN

For metric ISO thread DIN 13
Cutting material: HSS-E / PM
* up to and including M6 without neck



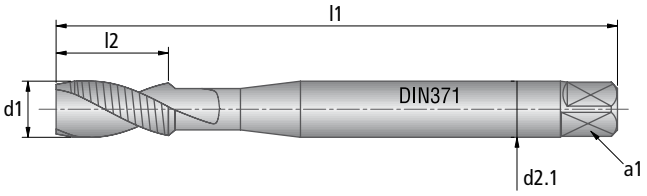


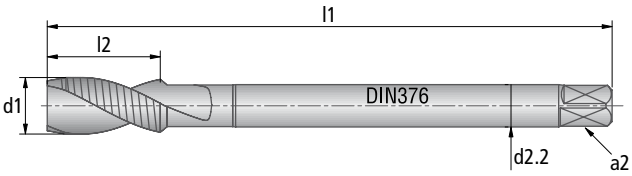
Type								TAREX	TAREX VAV	TAREX TiN	TAREX TiCN	TAREX OT TiN
Tolerance field								ISO 2	ISO 2	ISO 2	ISO 2	ISO 2
Dimensions (DIN)								371 to M10	371 to M10	371 to M10	371 to M10	371 to M10 *
								376 from M11	376 from M11	376 from M11	376 from M11	376 from M11
Material								HSS - E	HSS - E	HSS - E	HSS - E	PM
Chamfer form								C	C	C	C	C
Version								uncoated	vaporized	TiN	TiCN	vaporized
Nominal Ø d1	P	l1	l2	d2.1	a1	d2.2	a2	Order No.	Order No.	Order No.	Order No.	Order No.
M 1,4	0,30	40	4,0	2,5	2,1							
M 1,6	0,35	40	4,0	2,5	2,1							
M 1,7	0,35	40	4,0	2,5	2,1							
M 1,8	0,35	40	4,0	2,5	2,1							
M 2	0,40	45	4,0	2,8	2,1			20146001000008	20170001000008			
M 2,2	0,45	45	4,0	2,8	2,1							
M 2,3	0,40	45	4,0	2,8	2,1							
M 2,5	0,45	50	4,0	2,8	2,1			20146001000011	20170001000011			
M 2,6	0,45	50	4,0	2,8	2,1							
M 3	0,50	56	5,0	3,5	2,7			20146001000013	20170001000013	20346001000013	20646001000013	20342001000013
M 3,5	0,60	56	5,0	4,0	3,0			20146001000014	20170001000014			
M 4	0,70	63	7,0	4,5	3,4			20146001000015	20170001000015	20346001000015	20646001000015	20342001000015
M 4,5	0,75	70	7,0	6,0	4,9							
M 5	0,80	70	8,0	6,0	4,9			20146001000017	20170001000017	20346001000017	20646001000017	20342001000017
M 6	1,00	80	10,0	6,0	4,9			20146001000018	20170001000018	20346001000018	20646001000018	20342001000018
M 7	1,00	80	10,0	7,0	5,5							
M 8	1,25	90	12,0	8,0	6,2			20146001000020	20170001000020	20346001000020	20646001000020	20342001000020
M 9	1,25	90	12,0	9,0	7,0							
M10	1,50	100	14,0	10,0	8,0			20146001000022	20170001000022	20346001000022	20646001000022	20342001000022
M11	1,50	100	14,0			8,0	6,2					
M12	1,75	110	16,0			9,0	7,0	20147001000024	20171001000024	20347001000024	20647001000024	20343001000024
M14	2,00	110	20,0			11,0	9,0	20147001000025	20171001000025	20347001000025		
M16	2,00	110	20,0			12,0	9,0	20147001000026	20171001000026	20347001000026		
M18	2,50	125	24,0			14,0	11,0	20147001000027	20171001000027	20347001000027		
M20	2,50	140	24,0			16,0	12,0	20147001000028	20171001000028	20347001000028		
M22	2,50	140	24,0			18,0	14,5	20147001000029				
M24	3,00	160	28,0			18,0	14,5	20147001000030				
M27	3,00	160	28,0			20,0	16,0					
M30	3,50	180	36,0			22,0	18,0					

M HSS-E Taps

TAREX AL

For metric ISO thread DIN 13
Cutting material: HSS-E
* up to and including M6 without neck



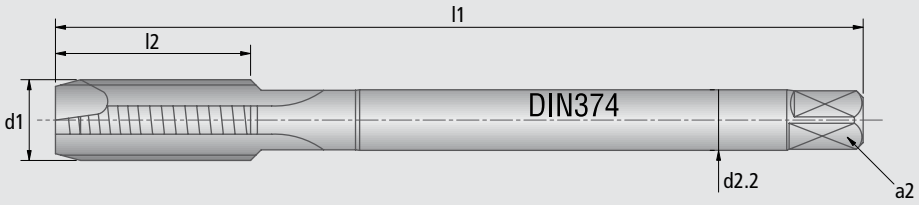


Type								TAREX AL
Tolerance field								ISO 2
Dimensions (DIN)								371 to M10
								376 from M11
Material								HSS - E
Chamfer form								C
Version								uncoated
Nominal Ø d1	**P**	**l1**	**l2**	**d2.1**	**a1**	**d2.2**	**a2**	**Order No.**
M 1,4	0,30	40	7,0	2,5	2,1			
M 1,6	0,35	40	8,0	2,5	2,1			
M 1,7	0,35	40	8,0	2,5	2,1			
M 1,8	0,35	40	8,0	2,5	2,1			
M 2	0,40	45	8,0	2,8	2,1			**20154001000008**
M 2,2	0,45	45	9,0	2,8	2,1			
M 2,3	0,40	45	9,0	2,8	2,1			
M 2,5	0,45	50	9,0	2,8	2,1			**20154001000011**
M 2,6	0,45	50	9,0	2,8	2,1			
M 3	0,50	56	11,0	3,5	2,7			**20154001000013**
M 3,5	0,60	56	13,0	4,0	3,0			
M 4	0,70	63	13,0	4,5	3,4			**20154001000015**
M 4,5	0,75	70	15,0	6,0	4,9			
M 5	0,80	70	16,0	6,0	4,9			**20154001000017**
M 6	1,00	80	18,0	6,0	4,9			**20154001000018**
M 7	1,00	80	18,0	7,0	5,5			
M 8	1,25	90	18,0	8,0	6,2			**20154001000020**
M 9	1,25	90	18,0	9,0	7,0			
M10	1,50	100	21,0	10,0	8,0			**20154001000022**
M11	1,50	100	21,0			8,0	6,2	
M12	1,75	110	24,0			9,0	7,0	**20155001000024**
M14	2,00	110	24,0			11,0	9,0	
M16	2,00	110	27,0			12,0	9,0	
M18	2,50	125	32,0			14,0	11,0	
M20	2,50	140	32,0			16,0	12,0	
M22	2,50	140	32,0			18,0	14,5	
M24	3,00	160	38,0			18,0	14,5	
M27	3,00	160	38,0			20,0	16,0	
M30	3,50	180	42,0			22,0	18,0	

MF HSS-E Taps

DOREX, DOREX VAV, DOREX TiN

For metric fine ISO thread DIN 13
Cutting material: HSS-E

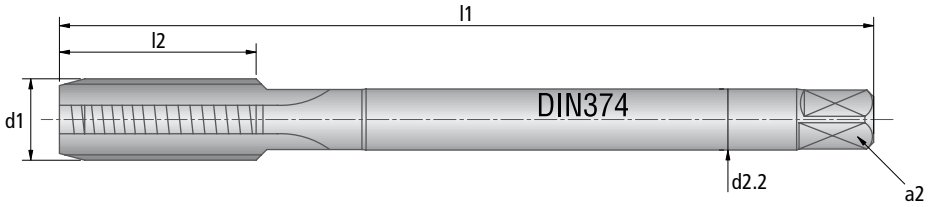


Type					DOREX	DOREX VAV	DOREX TiN
Tolerance field					ISO 2	ISO 2	ISO 2
Dimensions (DIN)					374	374	374
Thread length					l2.1	l2.1	l2.1
Material					HSS - E	HSS - E	HSS - E
Chamfer form					B	B	B
Version					uncoated	vaporized	TiN
Nominal Ø x P d1	l1	l2	d2.2	a2	Order No.	Order No.	Order No.
M 4x0,5	63	10	2,8	2,1	**20123002000029**		
M 5x0,5	70	12	3,5	2,7			
M 6x0,5	80	14	4,5	3,4			
M 6x0,75	80	14	4,5	3,4	**20123002000048**		
M 7x0,75	80	14	5,5	4,3			
M 8x0,5	80	14	6,0	4,9			
M 8x0,75	80	14	6,0	4,9			
M 8x1	90	18	6,0	4,9	**20123002000070**	**20137002000070**	**20323002000070**
M 9x1	90	18	7,0	5,5			
M10x0,75	90	14	7,0	5,5			
M10x1	90	18	7,0	5,5	**20123002000094**	**20137002000094**	**20323002000094**
M10x1,25	100	21	7,0	5,5			
M11x1	90	18	8,0	6,2			
M12x1	100	20	9,0	7,0	**20123002000111**		
M12x1,25	100	20	9,0	7,0			
M12x1,5	100	20	9,0	7,0	**20123002000113**	**20137002000113**	**20323002000113**
M14x1	100	20	11,0	9,0			
M14x1,25	100	20	11,0	9,0			
M14x1,5	100	20	11,0	9,0		**20137002000131**	**20323002000131**
M15x1	100	20	12,0	9,0			
M15x1,5	100	20	12,0	9,0			
M16x1	100	20	12,0	9,0			
M16x1,5	100	20	12,0	9,0	**20123002000147**	**20137002000147**	**20323002000147**
M18x1	110	24	14,0	11,0			
M18x1,5	110	24	14,0	11,0	**20123002000160**		
M20x1,5	125	24	16,0	12,0	**20123002000174**		
M22x1,5	125	24	18,0	14,5	**20123002000188**		
M24x1,5	140	24	18,0	14,5	**20123002000202**		
M26x1,5	140	24	18,0	14,5	**20123002000216**		
M28x1,5	140	28	20,0	16,0	**20123002000230**		
M30x1,5	150	28	22,0	18,0	**20123002000244**		

MF HSS-E Taps

GG, SIREX

For metric fine ISO thread DIN 13
Cutting material: HSS-E

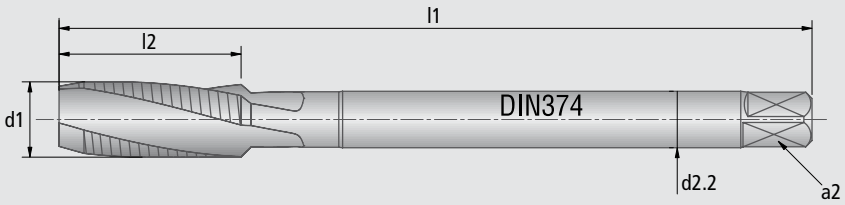


Type					GG	SIREX
Tolerance field					ISO 2X	ISO 2
Dimensions (DIN)					374	374
Thread length					l2.1	l2.1
Material					HSS - E	HSS - E
Chamfer form					C	C
Version					nitrided	uncoated
Nominal Ø x P d1	l1	l2	d2.2	a2	Order No.	Order No.
M 4x0,5	63	10	2,8	2,1		**20121002000029**
M 5x0,5	70	12	3,5	2,7		
M 6x0,5	80	14	4,5	3,4		
M 6x0,75	80	14	4,5	3,4		**20121002000048**
M 7x0,75	80	14	5,5	4,3		
M 8x0,5	80	14	6,0	4,9		
M 8x0,75	80	14	6,0	4,9		
M 8x1	90	18	6,0	4,9	**20157002000070**	**20121002000070**
M 9x1	90	18	7,0	5,5		
M10x0,75	90	14	7,0	5,5		
M10x1	90	18	7,0	5,5	**20157002000094**	**20121002000094**
M10x1,25	100	21	7,0	5,5		
M11x1	90	18	8,0	6,2		
M12x1	100	20	9,0	7,0		**20121002000111**
M12x1,25	100	20	9,0	7,0		
M12x1,5	100	20	9,0	7,0	**20157002000113**	**20121002000113**
M14x1	100	20	11,0	9,0		
M14x1,25	100	20	11,0	9,0		
M14x1,5	100	20	11,0	9,0	**20157002000131**	**20121002000131**
M15x1	100	20	12,0	9,0		
M15x1,5	100	20	12,0	9,0		
M16x1	100	20	12,0	9,0		
M16x1,5	100	20	12,0	9,0	**20157002000147**	**20121002000147**
M18x1	110	24	14,0	11,0		
M18x1,5	110	24	14,0	11,0		**20121002000160**
M20x1,5	125	24	16,0	12,0	**20157002000174**	**20121002000174**
M22x1,5	125	24	18,0	14,5		
M24x1,5	140	24	18,0	14,5		
M26x1,5	140	24	18,0	14,5		
M28x1,5	140	28	20,0	16,0		
M30x1,5	150	28	22,0	18,0		

MF HSS-E Taps

SIREX SR

For metric fine ISO thread DIN 13
Cutting material: HSS-E

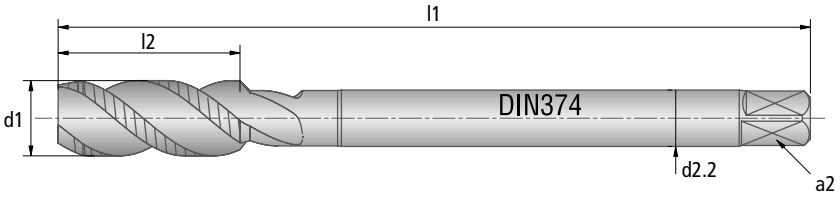


Type					SIREX SR
Tolerance field					ISO 2
Dimensions (DIN)					374
Thread length					l2.2
Material					HSS - E
Chamfer form					C
Version					uncoated
Nominal Ø x P d1	l1	l2	d2.2	a2	Order No.
M 4x0,5	63	10	2,8	2,1	**20145002000029**
M 5x0,5	70	12	3,5	2,7	
M 6x0,5	80	14	4,5	3,4	
M 6x0,75	80	14	4,5	3,4	**20145002000048**
M 7x0,75	80	14	5,5	4,3	
M 8x0,5	80	14	6,0	4,9	
M 8x0,75	80	14	6,0	4,9	
M 8x1	90	18	6,0	4,9	**20145002000070**
M 9x1	90	18	7,0	5,5	
M10x0,75	90	14	7,0	5,5	
M10x1	90	18	7,0	5,5	**20145002000094**
M10x1,25	100	21	7,0	5,5	
M11x1	90	18	8,0	6,2	
M12x1	100	20	9,0	7,0	**20145002000111**
M12x1,25	100	20	9,0	7,0	
M12x1,5	100	20	9,0	7,0	**20145002000113**
M14x1	100	20	11,0	9,0	
M14x1,25	100	20	11,0	9,0	
M14x1,5	100	20	11,0	9,0	**20145002000131**
M15x1	100	20	12,0	9,0	
M15x1,5	100	20	12,0	9,0	
M16x1	100	20	12,0	9,0	
M16x1,5	100	20	12,0	9,0	**20145002000147**
M18x1	110	24	14,0	11,0	
M18x1,5	110	24	14,0	11,0	**20145002000160**
M20x1,5	125	24	16,0	12,0	**20145002000174**
M22x1,5	125	24	18,0	14,5	
M24x1,5	140	24	18,0	14,5	
M26x1,5	140	24	18,0	14,5	
M28x1,5	140	28	20,0	16,0	
M30x1,5	150	28	22,0	18,0	

MF HSS-E Taps

TAREX, TAREX VAV, TAREX TiN

For metric fine ISO thread DIN 13
Cutting material: HSS-E

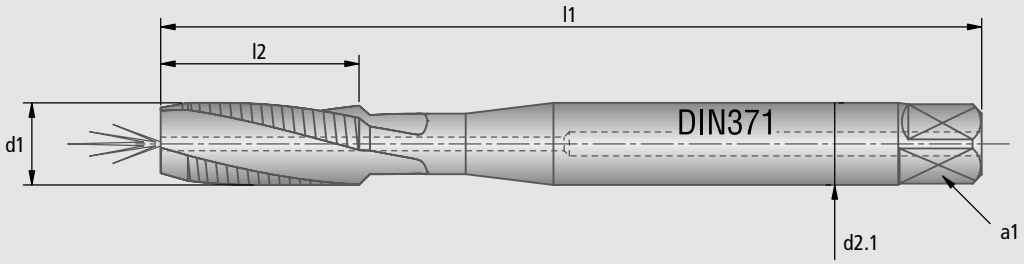


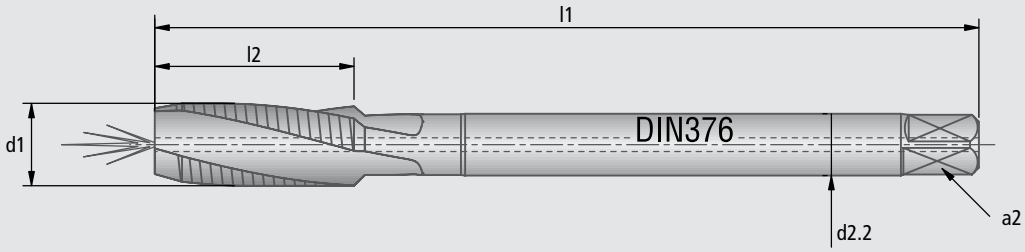
Type					TAREX	TAREX VAV	TAREX TiN
Tolerance field					ISO 2	ISO 2	ISO 2
Dimensions (DIN)					374	374	374
Thread length					l2.2	l2.2	l2.2
Material					HSS - E	HSS - E	HSS - E
Chamfer form					C	C	C
Version					uncoated	vaporized	TiN
Nominal Ø x P d1	l1	l2	d2.2	a2	Order No.	Order No.	Order No.
M 4x0,5	63	7,0	2,8	2,1	**20147002000029**		
M 5x0,5	70	8,0	3,5	2,7			
M 6x0,5	80	10,0	4,5	3,4			
M 6x0,75	80	10,0	4,5	3,4	**20147002000048**		
M 7x0,75	80	10,0	5,5	4,3			
M 8x0,5	80	12,0	6,0	4,9			
M 8x0,75	80	12,0	6,0	4,9			
M 8x1	90	12,0	6,0	4,9	**20147002000070**	**20171002000070**	**20347002000070**
M 9x1	90	12,0	7,0	5,5			
M10x0,75	90	14,0	7,0	5,5			
M10x1	90	14,0	7,0	5,5	**20147002000094**	**20171002000094**	**20347002000094**
M10x1,25	100	14,0	7,0	5,5			
M11x1	90	14,0	8,0	6,2			
M12x1	100	14,0	9,0	7,0	**20147002000111**		
M12x1,25	100	14,0	9,0	7,0			
M12x1,5	100	14,0	9,0	7,0	**20147002000113**	**20171002000113**	**20347002000113**
M14x1	100	16,0	11,0	9,0			
M14x1,25	100	16,0	11,0	9,0			
M14x1,5	100	16,0	11,0	9,0	**20147002000131**	**20171002000131**	**20347002000131**
M15x1	100	16,0	12,0	9,0			
M15x1,5	100	16,0	12,0	9,0			
M16x1	100	16,0	12,0	9,0			
M16x1,5	100	16,0	12,0	9,0	**20147002000147**	**20171002000147**	**20347002000147**
M18x1	110	18,0	14,0	11,0			
M18x1,5	110	18,0	14,0	11,0	**20147002000160**	**20171002000160**	
M20x1,5	125	20,0	16,0	12,0	**20147002000174**	**20171002000174**	
M22x1,5	125	20,0	18,0	14,5	**20147002000188**		
M24x1,5	140	20,0	18,0	14,5	**20147002000202**		
M26x1,5	140	20,0	18,0	14,5	**20147002000216**		
M28x1,5	140	22,0	20,0	16,0	**20147002000230**		
M30x1,5	150	24,0	22,0	18,0	**20147002000244**		

M HSS-E Taps with central coolant supply

SIREX SR IK, SIREX SR IK TiN, SIREX SR IK TiCN

For metric ISO thread DIN 13
Cutting material: HSS-E



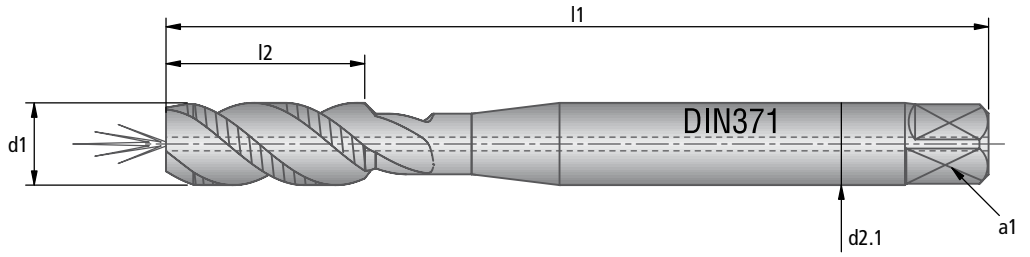


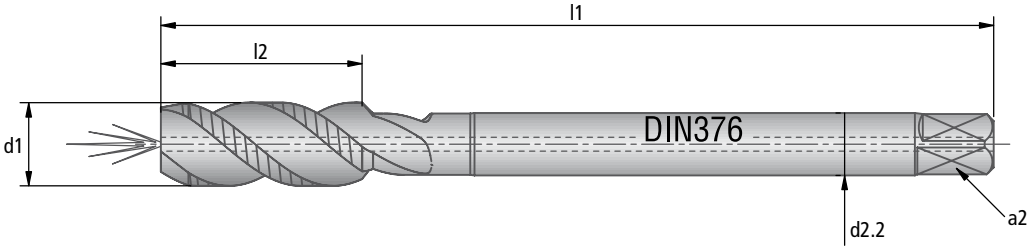
Type								SIREX SR IK	SIREX SR IK TiN	SIREX SR IK TiCN
Tolerance field								ISO 2	ISO 2	ISO 2
Dimensions (DIN)								371 to M10	371 to M10	371 to M10
								376 from M11	376 from M11	376 from M11
Material								HSS - E	HSS - E	HSS - E
Chamfer form								C	C	C
Version								uncoated	TiN	TiCN
Nominal Ø d1	P	l1	l2	d2.1	a1	d2.2	a2	Order No.	Order No.	Order No.
M 4	0,70	63	13,0	4,5	3,4					
M 4,5	0,75	70	15,0	6,0	4,9					
M 5	0,80	70	16,0	6,0	4,9					
M 6	1,00	80	18,0	6,0	4,9			20444001000018	20544001000018	20744001000018
M 7	1,00	80	18,0	7,0	5,5					
M 8	1,25	90	18,0	8,0	6,2			20444001000020	20544001000020	20744001000020
M 9	1,25	90	18,0	9,0	7,0					
M10	1,50	100	21,0	10,0	8,0			20444001000022	20544001000022	20744001000022
M11	1,50	100	21,0			8,0	6,2			
M12	1,75	110	24,0			9,0	7,0	20445001000024	20545001000024	20745001000024
M14	2,00	110	24,0			11,0	9,0			
M16	2,00	110	27,0			12,0	9,0			

M HSS-E Taps with central coolant supply

TAREX IK, TAREX IK TiN

For metric ISO thread DIN 13
Cutting material: HSS-E



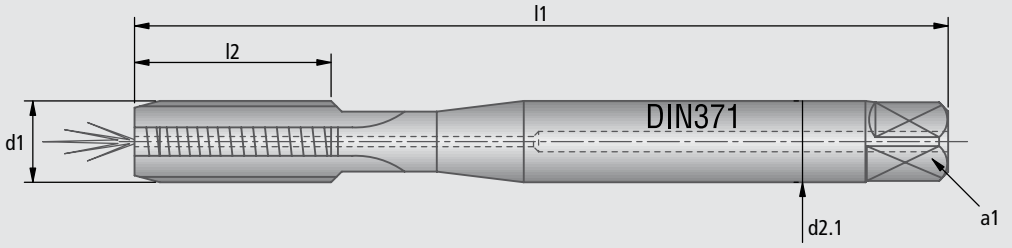


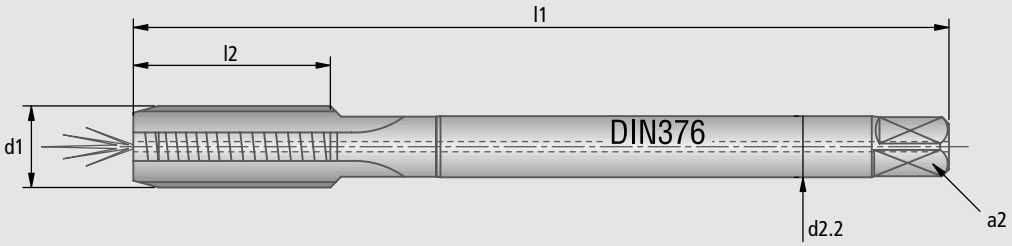
Type								TAREX IK	TAREX IK TiN
Tolerance field								ISO 2	ISO 2
Dimensions (DIN)								371 to M10	371 to M10
								376 from M11	376 from M11
Material								HSS - E	HSS - E
Chamfer form								C	C
Version								uncoated	TiN
Nominal Ø d1	**P**	**l1**	**l2**	**d2.1**	**a1**	**d2.2**	**a2**	**Order No.**	**Order No.**
M 4	0,70	63	7,0	4,5	3,4				
M 4,5	0,75	70	7,0	6,0	4,9				
M 5	0,80	70	8,0	6,0	4,9				
M 6	1,00	80	10,0	6,0	4,9			**20446001000018**	**20546001000018**
M 7	1,00	80	10,0	7,0	5,5				
M 8	1,25	90	12,0	8,0	6,2			**20446001000020**	**20546001000020**
M 9	1,25	90	12,0	9,0	7,0				
M10	1,50	100	14,0	10,0	8,0			**20446001000022**	**20546001000022**
M11	1,50	100	14,0			8,0	6,2		
M12	1,75	110	16,0			9,0	7,0	**20447001000024**	**20547001000024**
M14	2,00	110	20,0			11,0	9,0		
M16	2,00	110	20,0			12,0	9,0		

M HSS-E Taps with central coolant supply

GG IK, GG IK TiN

For metric ISO thread DIN 13
Cutting material: HSS-E



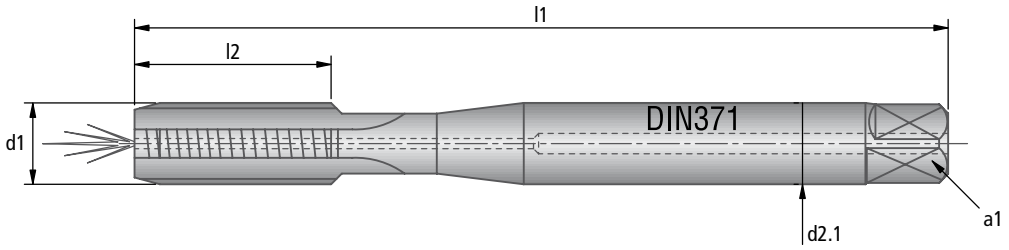


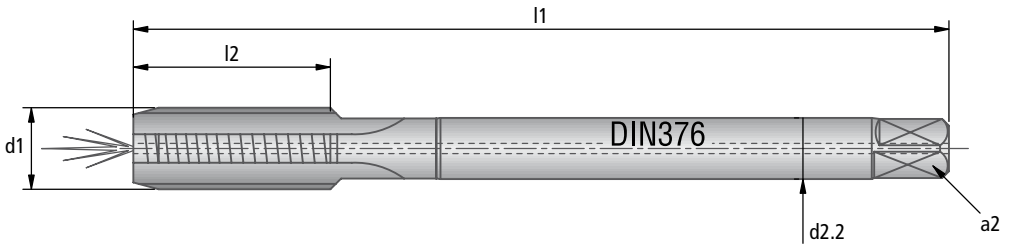
Type								GG IK	GG IK TiN
Tolerance field								ISO 2X	ISO 2X
Dimensions (DIN)								371 to M10	371 to M10
								376 from M11	376 from M11
Material								HSS - E	HSS - E
Chamfer form								C	C
Version								nitrided	TiN
Nominal Ø d1	**P**	**l1**	**l2**	**d2.1**	**a1**	**d2.2**	**a2**	**Order No.**	**Order No.**
M 4	0,70	63	13,0	4,5	3,4				
M 4,5	0,75	70	15,0	6,0	4,9				
M 5	0,80	70	16,0	6,0	4,9				
M 6	1,00	80	18,0	6,0	4,9			**20456001000018**	**20556001000018**
M 7	1,00	80	18,0	7,0	5,5				
M 8	1,25	90	18,0	8,0	6,2			**20456001000020**	**20556001000020**
M 9	1,25	90	18,0	9,0	7,0				
M10	1,50	100	21,0	10,0	8,0			**20456001000022**	**20556001000022**
M11	1,50	100	21,0			8,0	6,2		
M12	1,75	110	24,0			9,0	7,0	**20457001000024**	**20557001000024**
M14	2,00	110	24,0			11,0	9,0		
M16	2,00	110	27,0			12,0	9,0		

M Solid Carbide Taps

SIREX, GG

For metric ISO thread DIN 13
Cutting material: solid carbide
From nominal Ø M4 with internal coolant supply



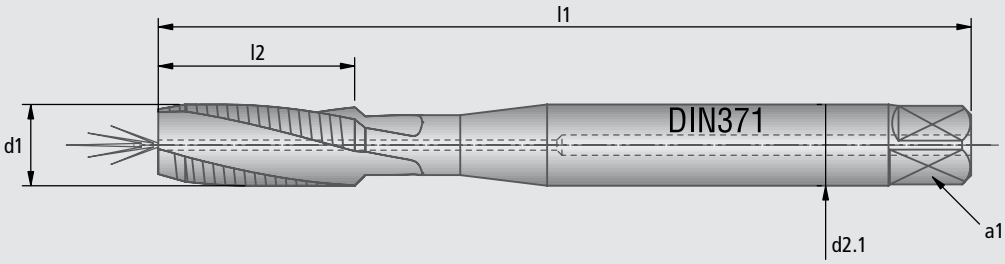


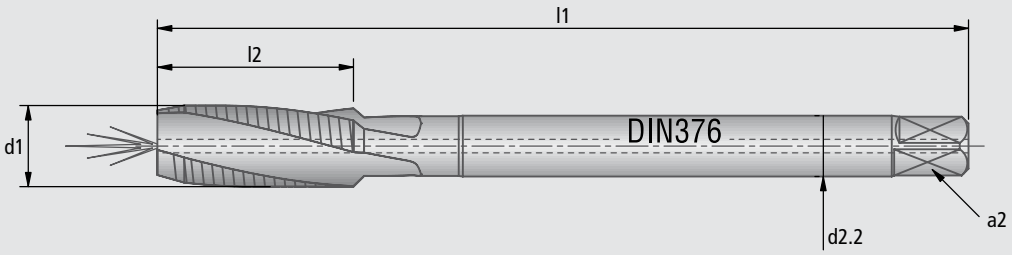
Type								SIREX	GG
Tolerance field								ISO 2	ISO 2X
Dimensions (DIN)								371 to M10	371 to M10
								376 from M11	376 from M11
Material								solid carbide	solid carbide
Chamfer form								C	C
Version								uncoated	uncoated
Nominal Ø d1	**P**	**l1**	**l2**	**d2.1**	**a1**	**d2.2**	**a2**	**Order No.**	**Order No.**
M 3	0,50	56	11,0	3,5	2,7			**80420001000013**	
M 3,5	0,60	56	13,0	4,0	3,0				
M 4	0,70	63	13,0	4,5	3,4			**80420001000015**	**80456001000015**
M 5	0,80	70	16,0	6,0	4,9			**80420001000017**	**80456001000017**
M 6	1,00	80	18,0	6,0	4,9			**80420001000018**	**80456001000018**
M 7	1,00	80	18,0	7,0	5,5				
M 8	1,25	90	18,0	8,0	6,2			**80420001000020**	**80456001000020**
M 9	1,25	90	18,0	9,0	7,0				
M10	1,50	100	21,0	10,0	8,0			**80420001000022**	**80456001000022**
M11	1,50	100	21,0			8,0	6,2		
M12	1,75	110	24,0			9,0	7,0	**80421001000024**	**80457001000024**
M14	2,00	110	24,0			11,0	9,0		
M16	2,00	110	27,0			12,0	9,0		

M Solid Carbide Taps

SIREX SR

For metric ISO thread DIN 13
Cutting material: solid carbide
From nominal Ø M4 with internal coolant supply



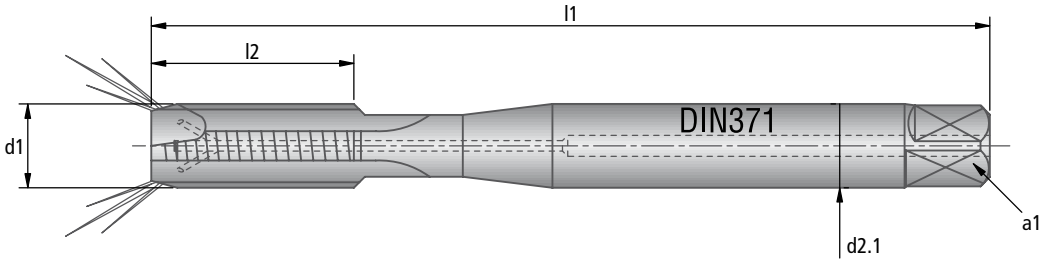


Type								SIREX SR
Tolerance field								ISO 2
Dimensions (DIN)								371 to M10
								376 from M11
Material								solid carbide
Chamfer form								C
Version								uncoated
Nominal Ø d1	**P**	**l1**	**l2**	**d2.1**	**a1**	**d2.2**	**a2**	**Order No.**
M 3	0,50	56	11,0	3,5	2,7			**80444001000013**
M 3,5	0,60	56	13,0	4,0	3,0			
M 4	0,70	63	13,0	4,5	3,4			**80444001000015**
M 5	0,80	70	16,0	6,0	4,9			**80444001000017**
M 6	1,00	80	18,0	6,0	4,9			**80444001000018**
M 7	1,00	80	18,0	7,0	5,5			
M 8	1,25	90	18,0	8,0	6,2			**80444001000020**
M 9	1,25	90	18,0	9,0	7,0			
M10	1,50	100	21,0	10,0	8,0			**80444001000022**
M11	1,50	100	21,0			8,0	6,2	
M12	1,75	110	24,0			9,0	7,0	**80445001000024**
M14	2,00	110	24,0			11,0	9,0	
M16	2,00	110	27,0			12,0	9,0	

M Solid Carbide Taps

DOREX

For metric ISO thread DIN 13
Cutting material: solid carbide
From nominal Ø M4 with internal coolant supply



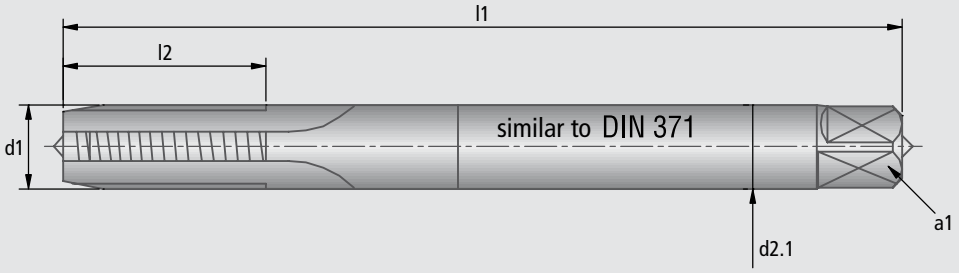
Type								DOREX
Tolerance field								ISO 2
Dimensions (DIN)								371 to M10
								376 from M11
Material								solid carbide
Chamfer form								B
Version								uncoated
Nominal Ø d1	**P**	**l1**	**l2**	**d2.1**	**a1**	**d2.2**	**a2**	**Order No.**
M 3	0,50	56	11,0	3,5	2,7			
M 3,5	0,60	56	13,0	4,0	3,0			
M 4	0,70	63	13,0	4,5	3,4			
M 5	0,80	70	16,0	6,0	4,9			
M 6	1,00	80	18,0	6,0	4,9			**80418001000018**
M 7	1,00	80	18,0	7,0	5,5			
M 8	1,25	90	18,0	8,0	6,2			**80418001000020**
M 9	1,25	90	18,0	9,0	7,0			
M10	1,50	100	21,0	10,0	8,0			**80418001000022**
M11	1,50	100	21,0			8,0	6,2	
M12	1,75	110	24,0			9,0	7,0	
M14	2,00	110	24,0			11,0	9,0	
M16	2,00	110	27,0			12,0	9,0	

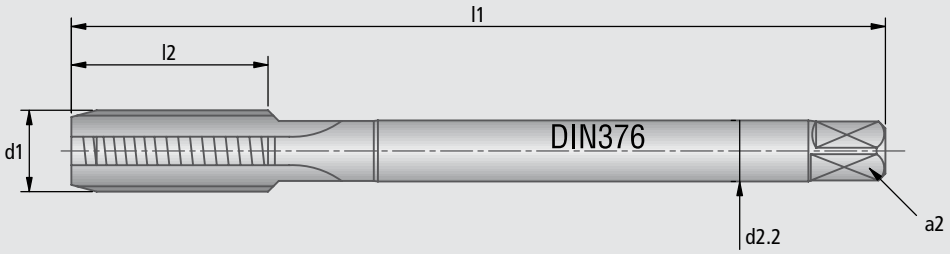
M Solid Carbide Taps

SIREX XH

For metric ISO thread DIN 13
For hard machining from 45 HRC hardness

Cutting material: solid carbide





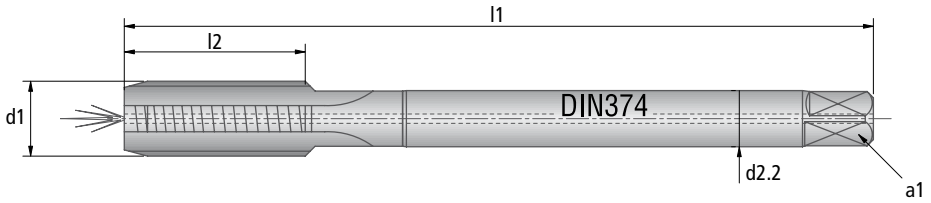
Type								SIREX XH	SIREX XH
Tolerance field								ISO 2X	ISO 2X
Dimensions (DIN)								similar to 371 to M10	similar to 371 to M10
								376 from M11	376 from M11
Material								solid carbide	solid carbide
Hardness								**to 58HRC**	**to 52HRC**
Chamfer form								**D**	**C**
Version								TiAlN	TiAlN
Nominal Ø d1	**P**	**l1**	**l2**	**d2.1**	**a1**	**d2.2**	**a2**	**Order No.**	**Order No.**
M 3	0,50	56	14,0	3,5	2,7				
M 3,5	0,60	56	18,0	4,0	3,0				
M 4	0,70	63	18,0	4,5	3,4			**80126001000015**	**80128001000015**
M 5	0,80	70	20,0	6,0	4,9			**80126001000017**	**80128001000017**
M 6	1,00	80	24,0	6,0	4,9			**80126001000018**	**80128001000018**
M 7	1,00	80	24,0	7,0	5,5				
M 8	1,25	90	24,0	8,0	6,2			**80126001000020**	**80128001000020**
M 9	1,25	90	24,0	9,0	7,0				
M10	1,50	100	26,0	10,0	8,0			**80126001000022**	**80128001000022**
M11	1,50	100	26,0			8,0	6,2		
M12	1,75	110	26,0			9,0	7,0	**80127001000024**	**80129001000024**
M14	2,00	110	26,0			11,0	9,0	**80127001000025**	**80129001000025**
M16	2,00	110	27,0			12,0	9,0	**80127001000026**	**80129001000026**

MF Solid Carbide Taps

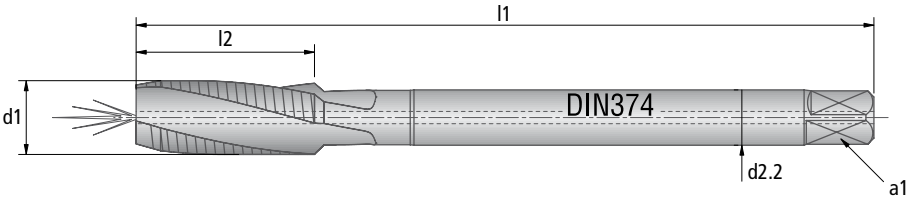
SIREX, SIREX SR

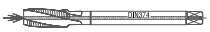
For metric fine ISO thread DIN 13
Cutting material: solid carbide
From nominal Ø M4 with internal coolant supply

SIREX



SIREX SR



Type							SIREX	SIREX SR
Tolerance field							ISO 2	ISO 2
Dimensions (DIN)							374	374
Material							solid carbide	solid carbide
Chamfer form							C	C
Version							uncoated	uncoated
Nominal Ø x P d1	l1	l2	d2.1	a1	d2.2	a2	 Order No.	 Order No.
M 4x0,5	63	10	4,5	3,4			**80420002000029**	**80444002000029**
M 5x0,5	70	12	6,0	4,9				
M 6x0,5	80	14	6,0	4,9				
M 6x0,75	80	14	6,0	4,9			**80420002000048**	**80444002000048**
M 8x0,5	80	14	8,0	4,9				
M 8x0,75	80	14	8,0	4,9				
M 8x1	90	18	8,0	4,9			**80420002000070**	**80444002000070**
M10x0,75	90	14			7,0	5,5		
M10x1	90	18			7,0	5,5	**80421002000094**	**80445002000094**
M10x1,25	100	21			7,0	5,5		
M11x1	90	18			8,0	6,2		
M12x1	100	20			9,0	7,0		
M12x1,25	100	20			9,0	7,0		
M12x1,5	100	20			9,0	7,0	**80421002000113**	**80445002000113**
M14x1	100	20			11,0	9,0		
M14x1,25	100	20			11,0	9,0		
M14x1,5	100	20			11,0	9,0	**80421002000131**	**80445002000131**
M15x1	100	20			12,0	9,0		
M15x1,5	100	20			12,0	9,0		
M16x1	100	20			12,0	9,0		
M16x1,5	100	20			12,0	9,0	**80421002000147**	**80445002000147**
M18x1	110	24			14,0	11,0		
M18x1,5	110	24			14,0	11,0		
M20x1,5	125	24			16,0	12,0		

Roll Form Taps and Cut Taps

Roll Form Taps

Chip-less manufacturing by thread forming
Depending on the application in question, we offer the following cutting materials: HSS-E, powder metal and solid carbide.

Roll Form Taps with carbide strips
The combination of elastic tool body and hard carbide strips produce a high degree of bending strength and wear resistance in the tool. This produces extremely long tool life and economic results.

Taps

Chip-producing thread manufacturing

JEL tap drills open up a wide range of applications in the chip-producing thread manufacturing. Whether you choose flood coolant, internal coolant supply, minimal lubrication or dry machining, we can provide the suitable tool.

Roll Form Taps

Compared to tapping, no chips are produced when doing roll form tapping.
Materials with an elongation of >5% and a tensile strength of <1000N/m² are suitable for thread forming.
Formed threads have a smoother surface and are stronger under dynamic stress than those that are cut.

Solid carbide roll form taps achieve a tool life up to 20 times longer than those in HSS-E.

Patented thread forming tools in HSS-E with brazed carbide strips are particularly suited to use on transfer lines. The flexible tool body compensates for small alignment errors while the carbide produces maximum durability in the working area.

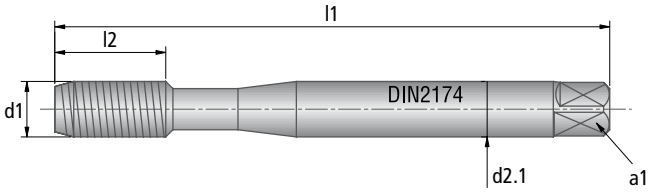
Restrictions: thin-walled components with a wall thickness <2× pitch are not suitable for thread forming.

Roll Form Taps

M HSS-E Roll Form Taps

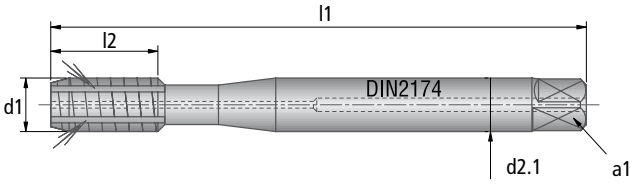
MOREX TiN, MOREX N TiN

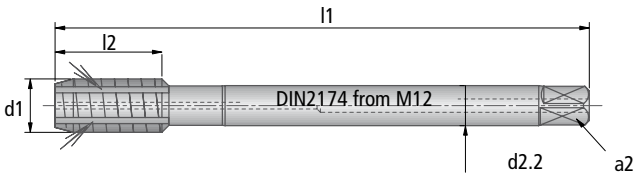
For metric ISO thread DIN 13
Cutting material: HSS-E



MOREX IK TiN, MOREX N IKS TiN

For metric ISO thread DIN 13
Cutting material: HSS-E



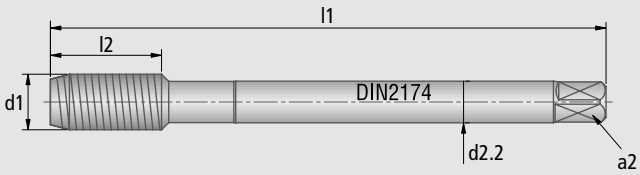


Type								MOREX TiN	MOREX IK TiN	MOREX N TiN	MOREX N IKS TiN
Tolerance field								ISO 2X	ISO 2X	ISO 2X	ISO 2X
Dimensions (DIN)								2174	2174	2174	2174
Material								HSS-E	HSS-E	HSS-E	HSS-E
Chamfer form								C	C	C	C
Version								TiN	TiN	TiN	TiN
Nom. Ø d1	P	l1	l2	d2.1	a1	d2.2	a2	Order No.	Order No.	Order No.	Order No.
M 1	0,25	40	5,5	2,5	2,1						
M 1,1	0,25	40	5,5	2,5	2,1						
M 1,2	0,25	40	5,5	2,5	2,1						
M 1,4	0,30	40	7,0	2,5	2,1						
M 1,6	0,35	40	8,0	2,5	2,1						
M 1,7	0,35	40	8,0	2,5	2,1						
M 1,8	0,35	40	8,0	2,5	2,1						
M 2	0,40	45	8,0	2,8	2,1			20374001000008			
M 2,2	0,45	45	9,0	2,8	2,1						
M 2,3	0,40	45	9,0	2,8	2,1						
M 2,5	0,45	50	9,0	2,8	2,1			20374001000011			
M 2,6	0,45	50	9,0	2,8	2,1						
M 3	0,50	56	11,0	3,5	2,7			20374001000013		20376001000013	
M 3,5	0,60	56	13,0	4,0	3,0						
M 4	0,70	63	13,0	4,5	3,4			20374001000015		20376001000015	
M 4,5	0,75	70	15,0	6,0	4,9						
M 5	0,80	70	16,0	6,0	4,9			20374001000017		20376001000017	
M 6	1,00	80	18,0	6,0	4,9			20374001000018	20574001000018	20376001000018	20598001000018
M 7	1,00	80	18,0	7,0	5,5						
M 8	1,25	90	18,0	8,0	6,2			20374001000020	20574001000020	20376001000020	20598001000020
M 9	1,25	90	18,0	9,0	7,0						
M10	1,50	100	21,0	10,0	8,0			20374001000022	20574001000022	20376001000022	20598001000022
M11	1,50	100	21,0			8,0	6,2				
M12	1,75	110	24,0			9,0	7,0	20375001000024	20575001000024	20377001000024	20599001000024
M14	2,00	110	24,0			11,0	9,0	20375001000025	20575001000025	20377001000025	
M16	2,00	110	27,0			12,0	9,0		20575001000026		
M18	2,50	125	32,0			14,0	11,0				
M20	2,50	140	32,0			16,0	12,0				

MF HSS-E Roll Form Taps

MOREX TiN, MOREX IK TiN, MOREX N TiN, MOREX N IKS TiN

For metric ISO fine pitch thread DIN 13
Cutting material: HSS-E



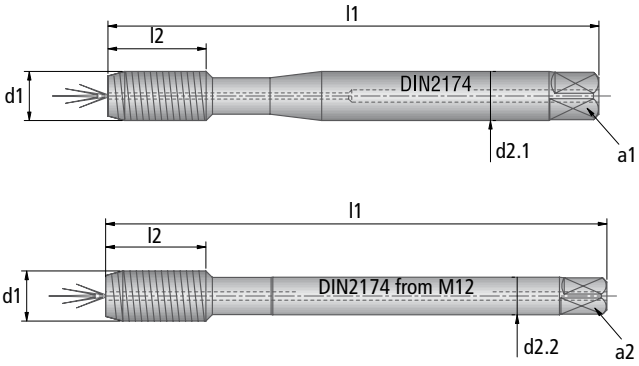
Type					MOREX TiN	MOREX IK TiN	MOREX N TiN	MOREX N IKS TiN
Tolerance field					ISO 2X	ISO 2X	ISO 2X	ISO 2X
Dimensions (DIN)					2174	2174	2174	2174
Material					HSS-E	HSS-E	HSS-E	HSS-E
Chamfer form					C	C	C	C
Version					TiN	TiN	TiN	TiN
Nom. Ø x P d1	l1	l2	d2.2	a2	Order No.	Order No.	Order No.	Order No.
M 3,5x0,35	56	10,0	2,5	2,1				
M 4x0,35	63	10,0	2,8	2,1				
M 4x0,5	63	10,0	2,8	2,1				
M 5x0,5	70	12,0	3,5	2,7				
M 6x0,5	80	14,0	4,5	3,4				
M 6x0,75	80	14,0	4,5	3,4				
M 7x0,75	80	14,0	5,5	4,3				
M 8x0,5	80	14,0	6,0	4,9				
M 8x0,75	80	14,0	6,0	4,9				
M 8x1	90	18,0	6,0	4,9				
M 9x1	90	18,0	7,0	5,5				
M10x0,75	90	14,0	7,0	5,5				
M10x1	90	18,0	7,0	5,5	**20375002000094**	**20575002000094**	**20377002000094**	**20599002000094**
M10x1,25	100	21,0	7,0	5,5				
M11x1	90	18,0	8,0	6,2				
M12x1	100	20,0	9,0	7,0				
M12x1,25	100	20,0	9,0	7,0				
M12x1,5	100	20,0	9,0	7,0	**20375002000113**	**20575002000113**	**20377002000113**	**20599002000113**
M14x1	100	20,0	11,0	9,0				
M14x1,25	100	20,0	11,0	9,0				
M14x1,5	100	20,0	11,0	9,0	**20375002000131**	**20575002000131**	**20377002000131**	**20599002000131**
M15x1	100	20,0	12,0	9,0				
M15x1,5	100	20,0	12,0	9,0				
M16x1	100	20,0	12,0	9,0				
M16x1,5	100	20,0	12,0	9,0	**20375002000147**	**20575002000147**	**20377002000147**	**20599002000147**
M18x1	110	24,0	14,0	11,0				
M18x1,5	110	24,0	14,0	11,0				
M18x2	125	24,0	14,0	11,0				
M20x1	125	24,0	16,0	12,0				
M20x1,5	125	24,0	16,0	12,0				
M20x2	140	24,0	16,0	12,0				

M Solid Carbide Roll Form Taps

MOREX IK, MOREX IK TiN

For metric ISO thread DIN 13

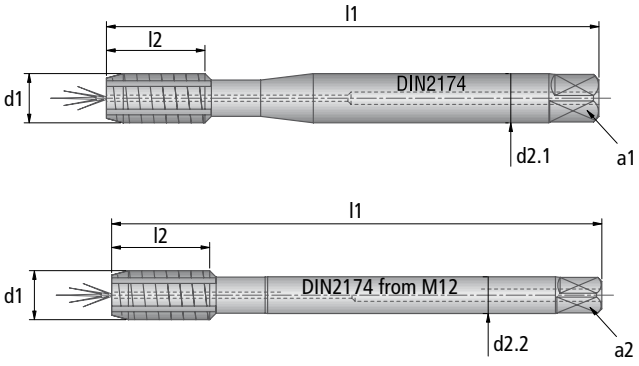
Tools with internal coolant
Cutting material: solid carbide



MOREX N IK, MOREX N IK TiN

For metric ISO thread DIN 13

Tools with internal coolant
Cutting material: solid carbide



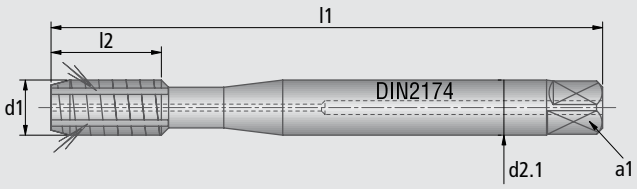
Type								MOREX IK	MOREX IK TiN	MOREX N IK	MOREX N IK TiN
Tolerance field								ISO 2X	ISO 2X	ISO 2X	ISO 2X
Dimensions (DIN)								2174	2174	2174	2174
Material								solid carbide	solid carbide	solid carbide	solid carbide
Chamfer form								C	C	C	C
Version								uncoated	TiN	uncoated	TiN
Nom. Ø d1	P	l1	l2	d2.1	a1	d2.2	a2	Order No.	Order No.	Order No.	Order No.
M 1	0,25	40	5,5	2,5	2,1						
M 1,1	0,25	40	5,5	2,5	2,1						
M 1,2	0,25	40	5,5	2,5	2,1						
M 1,4	0,30	40	7,0	2,5	2,1						
M 1,6	0,35	40	8,0	2,5	2,1						
M 1,7	0,35	40	8,0	2,5	2,1						
M 1,8	0,35	40	8,0	2,5	2,1						
M 2	0,40	45	8,0	2,8	2,1						
M 2,2	0,45	45	9,0	2,8	2,1						
M 2,3	0,40	45	9,0	2,8	2,1						
M 2,5	0,45	50	9,0	2,8	2,1						
M 2,6	0,45	50	9,0	2,8	2,1						
M 3	0,50	56	11,0	3,5	2,7						
M 3,5	0,60	56	13,0	4,0	3,0						
M 4	0,70	63	13,0	4,5	3,4			80474001000015	80574001000015	80476001000015	80576001000015
M 4,5	0,75	70	15,0	6,0	4,9						
M 5	0,80	70	16,0	6,0	4,9			80474001000017	80574001000017	80476001000017	80576001000017
M 6	1,00	80	18,0	6,0	4,9			80474001000018	80574001000018	80476001000018	80576001000018
M 7	1,00	80	18,0	7,0	5,5						
M 8	1,25	90	18,0	8,0	6,2			80474001000020	80574001000020	80476001000020	80576001000020
M 9	1,25	90	18,0	9,0	7,0						
M10	1,50	100	21,0	10,0	8,0			80474001000022	80574001000022	80476001000022	80576001000022
M11	1,50	100	21,0			8,0	6,2				
M12	1,75	110	24,0			9,0	7,0	80475001000024	80575001000024	80477001000024	80577001000024
M14	2,00	110	24,0			11,0	9,0				
M16	2,00	110	27,0			12,0	9,0				
M18	2,50	125	32,0			14,0	11,0				
M20	2,50	140	32,0			16,0	12,0				

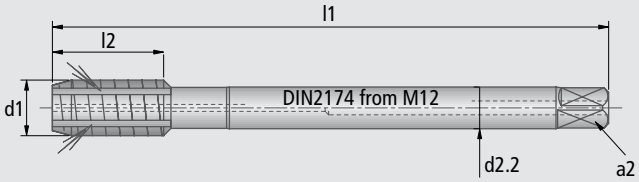
M Solid Carbide Roll Form Taps

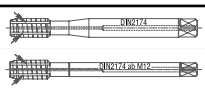
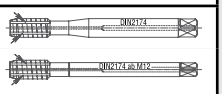
MOREX N IKS

For metric ISO thread DIN 13

Tools with lateral flute coolant supply
Cutting material: solid carbide



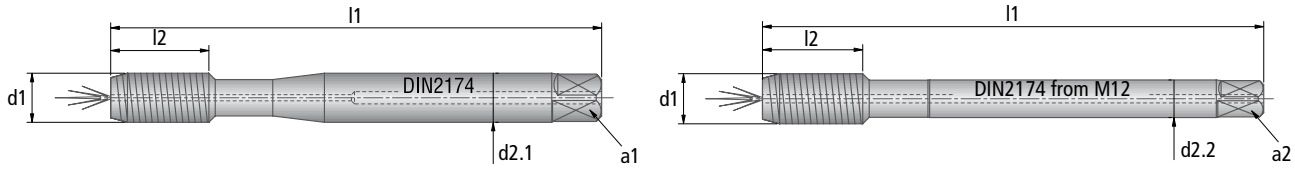


Type								MOREX N IKS	MOREX N IKS TiN
Tolerance field								ISO 2X	ISO 2X
Dimensions (DIN)								2174	2174
Material								solid carbide	solid carbide
Chamfer form								C	C
Version								uncoated	TiN
									
Nom. Ø d1	P	l1	l2	d2.1	a1	d2.2	a2	Order No.	Order No.
M 1	0,25	40	5,5	2,5	2,1				
M 1,1	0,25	40	5,5	2,5	2,1				
M 1,2	0,25	40	5,5	2,5	2,1				
M 1,4	0,30	40	7,0	2,5	2,1				
M 1,6	0,35	40	8,0	2,5	2,1				
M 1,7	0,35	40	8,0	2,5	2,1				
M 1,8	0,35	40	8,0	2,5	2,1				
M 2	0,40	45	8,0	2,8	2,1				
M 2,2	0,45	45	9,0	2,8	2,1				
M 2,3	0,40	45	9,0	2,8	2,1				
M 2,5	0,45	50	9,0	2,8	2,1				
M 2,6	0,45	50	9,0	2,8	2,1				
M 3	0,50	56	11,0	3,5	2,7				
M 3,5	0,60	56	13,0	4,0	3,0				
M 4	0,70	63	13,0	4,5	3,4			80494001000015	80594001000015
M 4,5	0,75	70	15,0	6,0	4,9				
M 5	0,80	70	16,0	6,0	4,9			80494001000017	80594001000017
M 6	1,00	80	18,0	6,0	4,9			80494001000018	80594001000018
M 7	1,00	80	18,0	7,0	5,5				
M 8	1,25	90	18,0	8,0	6,2			80494001000020	80594001000020
M 9	1,25	90	18,0	9,0	7,0				
M10	1,50	100	21,0	10,0	8,0			80494001000022	80594001000022
M11	1,50	100	21,0			8,0	6,2		
M12	1,75	110	24,0			9,0	7,0	80495001000024	80595001000024
M14	2,00	110	24,0			11,0	9,0		
M16	2,00	110	27,0			12,0	9,0		
M18	2,50	125	32,0			14,0	11,0		
M20	2,50	140	32,0			16,0	12,0		

M HSS-E Roll Form Taps with carbide strips

MOREX HML IK, MOREX HML IK TiN

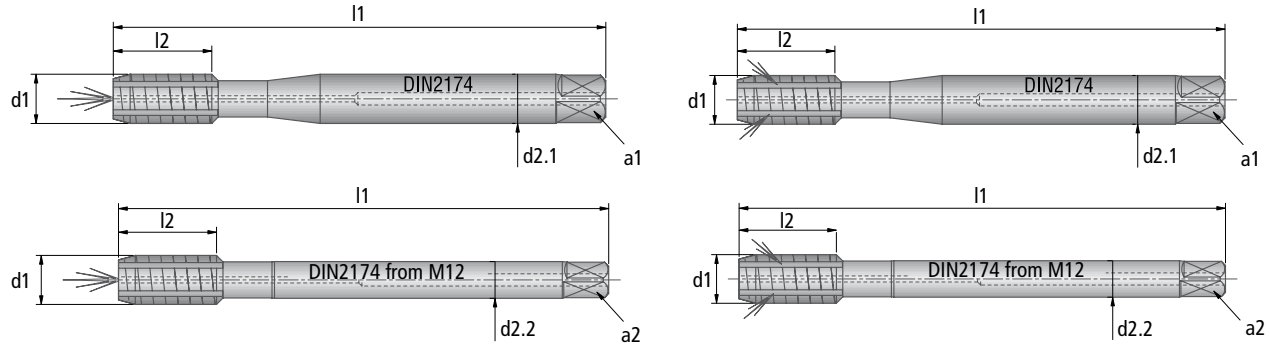
For metric ISO thread DIN 13
HSS-E with carbide strips
From nominal Ø M6 with internal coolant supply



Type								MOREX HML IK	MOREX HML IK TiN
Tolerance field								ISO 2X	ISO 2X
Dimensions (DIN)								2174	2174
Material								Carbide tipped	Carbide tipped
Chamfer form								C	C
Version								uncoated	TiN
Nom. Ø d1	P	l1	l2	d2.1	a1	d2.2	a2	Order No.	Order No.
M 5	0,80	70	16	6	5				
M 6	1,00	80	18	6	5			**90174001000018**	**90374001000018**
M 8	1,25	90	18	8	6			**90174001000020**	**90374001000020**
M10	1,50	100	21	10	8			**90174001000022**	**90374001000022**
M12	1,75	110	24			9	7	**90175001000024**	**90375001000024**
M14	2,00	110	24			11	9		
M16	2,00	110	27			12	9		

MOREX N HML IK, MOREX N HML IKS TiN

From nominal Ø M6 with lateral flute coolant supply

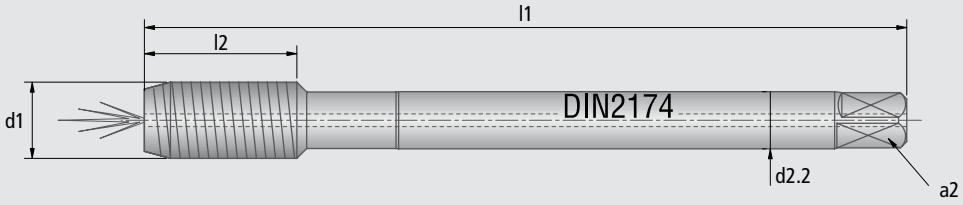


Type								MOREX N HML IK	MOREX N HML IKS TiN
Tolerance field								ISO 2X	ISO 2X
Dimensions (DIN)								2174	2174
Material								Carbide tipped	Carbide tipped
Chamfer form								C	C
Version								uncoated	TiN
Nom. Ø d1	P	l1	l2	d2.1	a1	d2.2	a2	Order No.	Order No.
M 6	1,00	80	18	6	5			**90176001000018**	**90496001000018**
M 8	1,25	90	18	8	6			**90176001000020**	**90496001000020**
M10	1,50	100	21	10	8			**90176001000022**	**90496001000022**
M12	1,75	110	24			9	7	**90177001000024**	**90497001000024**

MF HSS-E Roll Form Taps with carbide strips

MOREX HML IK

For metric ISO fine pitch thread DIN 13
HSS-E with carbide strips
From nominal Ø M6x0.75 with internal coolant supply



Type							MOREX HML IK
Tolerance field							ISO 2X
Dimensions (DIN)							2174
Material							Carbide tipped
Chamfer form							C
Version							uncoated
Nom. Ø x P d1	l1	l2	d2.1	a1	d2.2	a2	Order No.
M 6x0,75	80	14	6	5			
M 8x0,75	80	14	8	6			
M 8x1	90	18	8	6			
M10x1	90	18			7	6	**90175002000094**
M12x1	100	20			9	7	
M12x1,5	100	20			9	7	**90175002000113**
M14x1	100	20			11	9	
M14x1,5	100	20			11	9	
M16x1	100	20			12	9	
M16x1,5	100	20			12	9	
M18x1	110	24			14	11	
M18x1,5	110	24			14	11	
M20x1	125	24			16	12	
M20x1,5	125	24			16	12	

Technical notes on applications

JEL special solutions

The development of innovative special tools in close cooperation with our customers is part of our everyday business.
Below you will see a few examples of special solutions:

Machining example:

Drill thread milling tool VABOS-K
Housing in G-AlSi10Mg
- drilling Ø 5 mm
- chamfering 90°
- spot facing Ø 50 mm with PCD
- thread milling M6

Cylcle time: 3.9 secs.

JEL special solutions

JEL combination tools
Take advantage of our know-how to reduce your production costs.

Special drill thread milling tool with counterbore and spotfacing features.

PCD special boring tool

PCD special milling tool (buttress thread) PCD-VABOS-M

VABOS-M drill thread milling tool combined with multiple step indexable boring tool.

(Drill) Thread milling tool – achievable thread lengths

		Steel	Stainless steel	Grey cast iron	Nodular grey cast iron	Titanium alloys	Nickel alloys	Copper alloys	Aluminium	Plastics
Drill thread milling BGF				2,5xD	2,0xD			2,5xD	2,5xD	2,5xD
Thread milling MKG		2,0xD	2,0xD	2,0xD	2,0xD	1,5xD	1,5xD	2,0xD	2,0xD	2,0xD
Thread milling MGF		2,0xD	2,0xD	2,5xD	2,5xD	1,5xD	1,5xD	2,5xD	2,5xD	2,5xD

(Drill) Thread milling

Formulae

		Calculation	Unit
Spindle speed	**n**	$\frac{v_c \cdot 1000}{\pi \cdot \text{bore diameter}}$	r.p.m.
No. of teeth	**z**		
Cutting speed	**v_c**	$\frac{n \cdot \pi \cdot \text{bore diameter}}{1000}$	m/min
Milling feed	**f_z**		mm/teeth
Boring feed	**f**		mm/rev
Tool radius	**r_f**	$R_1 - e$	mm
Eccentricity	**e**	$R_1 - r_f$	mm
Amount of withdrawal for conventional milling	**g**	$1{,}3 \cdot \text{pitch} + \frac{e}{\tan\left(\frac{\alpha}{2}\right)}$	mm
Amount of withdrawal for climb milling	**g**	$\frac{e}{\tan\left(\frac{\alpha}{2}\right)}$ ①	mm
Nominal thread diameter	**D**		mm
Nominal thread radius	**R_1**	$\frac{D}{2}$	mm
Radius entry loop, external path (J)	**R_2**	$\frac{r_f + R_1}{2}$	mm
z dimension entry and exit loop	**z**	$p \cdot 0{,}15$	mm
Radius entry loop, centre path (J)	**R_3**	$\frac{e}{2}$	mm
Radius full circle, centre path (=e)	**R_4**	e	mm

① $\tan\left(\frac{\alpha}{2}\right)$ equals where $\alpha = 90°$ countersink angle = tan45° = 1

where countersink angle is 60° the amount of withdrawal is larger

Please see note on Page 152

Feeds		**Contour path**	**Centre point path**
Entry loop	**F_1**	$n \cdot z \cdot f_z$	$n \cdot z \cdot f_z \cdot \frac{e}{r_f + R_1}$
Full circle	**F_2**	$n \cdot z \cdot f_z$	$n \cdot z \cdot f_z \cdot \frac{2 \cdot e}{D}$
Exit loop	**F_3**	$n \cdot z \cdot f_z \cdot 2{,}5$	$F_2 \cdot 2{,}5$

(Drill) Thread milling

CNC program – step-by-step explanation

Machining task: **Material:**

Thread: M10, depth = 20.560 (EL)
Bore: blind bore, D=8,500 mm, cyl. depth=22,060 mm
Chamfer steps:
1) tapered, D=10,300 mm, W = 90.0°

7.2 aluminium alloy (A5 < 14%), AlMn 1 Mg 0,5, 3.0525

Tool:

BGF-M10 2.0D, uncoated
Milling tool radius = 3.980 mm
Eccentricity = 1.020 mm
Order No.: 80.9410.01.000022
Drawing No.: 80.9410.01.000022.01

Cutting values (external track):

Vc = 400 m/min n = 14980 rev/min
fs = 0.300 mm/rev F = 4494 mm/min (chamfering)
fb = 0.300 mm/rev F = 4494 mm/min (drilling)
fz1 = 0.100 mm/tooth F1 = 2996 mm/min (thread milling)

Main time: 4.0 secs

NC machine:

Drive: standard NC machine
Max. spindle speed: 15000 rev/min
Control: Sinumerik
Ref.: contour path, incremental

NC options:

Entry loop: 180°
Exit loop: 180°
Milling method: conventional milling
Chip removal: single, degressive

Note: **Deepest tool position = 23,370 mm**
For control systems where the feed relates to the central track, the figures given in brackets must be used

`N5 G00 G53 G40 G60 G90 D0 Z+0.0000`	Initialisation, absolute coordinates
`N10 G80`	Deselect any existing cycles
`N15 T1 M06`	Tool selection
`N20 G54 X+0.0000 Y+0.0000 M07`	Zero point shift
`N25 Z+1.0000 D1 S14980 M03`	Move to start pos. 1 mm above workpiece
`N30 G01 Z-1.3000 F1498`	Start bore with reduced boring feed
`N35 G01 Z-15.6580 F4494`	Bore to first boring depth
`N40 G00 Z+0.0000`	Clear chips (“chip clearance”, “blow through”)
`N45 G00 Z-14.6580`	Move to start position for second boring depth
`N50 G01 Z-23.3700`	Bore to end bore depth
`N55 G00 Z+0.0000`	Clear chips
`;(C O N V E N T I O N A L M I L L I N G)`	
`N60 G00 Z-20.4000`	Move to start position for thread milling
`N65 G01 G91 G42 G64 X+0.0000 Y+3.9800 F2996 ;(F340)`	Incremental coordinates, select milling radius adjustment, No movement
`N70 G02 X+0.0000 Y-8.9800 I+0.0000 J-4.4900 Z-0.2250`	Entry loop with pitch adjustment (Z = 0.15×P)
`N75 G02 X+0.0000 Y+0.0000 I+0.0000 J+5.0000 Z-1.5000 ;(F611)`	Thread finish milling to nominal dimension (Z = P)
`N80 G02 X+0.0000 Y+8.9800 I+0.0000 J+4.4900 Z-0.2250 F7490 ;(F851)`	Exit loop with pitch adjustment (Z = 0.15×P)
`N85 G00 G40 G60 X+0.0000 Y-3.9800`	Deselect milling radius adjustment
`N90 G00 G53 G40 G90 D0 Z+0.0000 M95`	Exit status
`N95 M30`	End of program

CNC programs can be configured on line at http://tpt.kometgroup.com or can be obtained on request from tel.: +49 (0) 711 78891-0

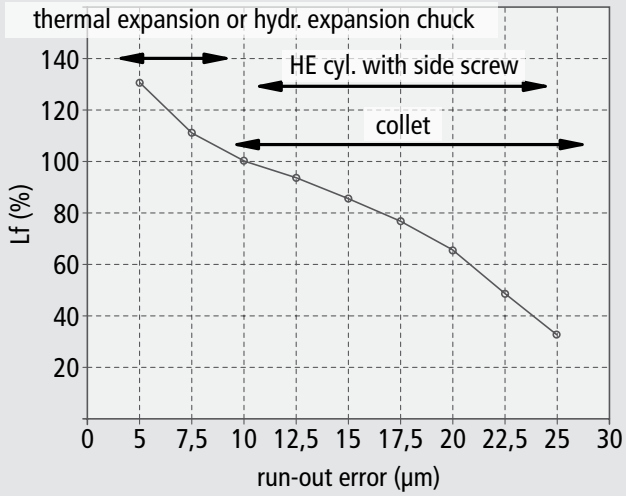
Setting (drill) thread milling tools

Preparations on tool

Tool clamping

- Correct alignment of clamping screw on clamping surface for Whistle-Notch adaptor
- Minimise overhang but the cutting sweep for the tool should be beyond the adaptor

Effect of concentricity on tool life using a solid carbide thread milling tool as an example



Material:
heat treated steel
Rm = 1000 N/mm²

Cutting values:
Size: M10
v_c = 100 m/min
f_z = 0,06 mm/tooth

Tool measurement

- Only measure tool length on pre-setter.
- Check concentricity at drill tip resp. thread milling section <0.02 mm
- Use tool radius shown on the CNC program

Preparations on machine

- Key in tool length and tool radius into offset register of the control

Program test

- Do a test run over the workpiece (increase tool length in tool record)
- Check machining time. If the time recorded is clearly different to that given in the program, there is an error in the feed rate calculation (contour path/centrer point path)
- Optimise coolant supply. If flood coolant used, i.e. direct coolant flow onto the milling section of the tool. For through holes use flood coolant if there is no lateral flute coolant supply on the tool.

Milling method for different materials

Cast aluminium

- Can be carried out without a peck cycle
- For tools with internal coolant there is no need for chip clearance after boring.

Long chipping aluminium

- At least one peck cycle
- Radial division of cut may be necessary if a thread with very low burring is required

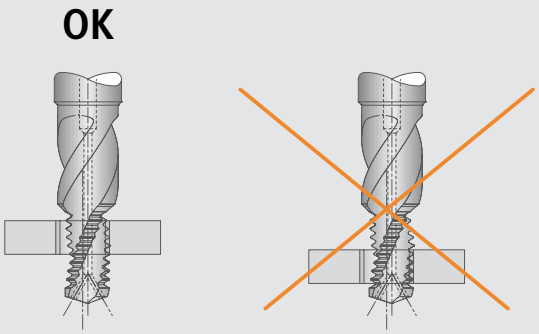
Grey cast iron

- No chip clearance
- Conventional thread milling in one path . Over 2×D two paths may be required.

Special cases

Through hole

- For tool with internal coolant, switch to external coolant for milling
- To reduce side load, preferably work with milling section on shank side



Angled bore exit / cutting through cross holes

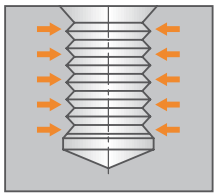
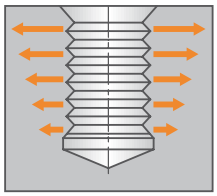
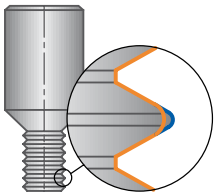
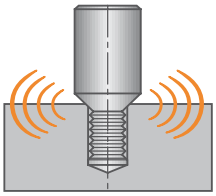
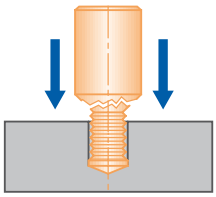
- Reduce bore feed rate at bore exit by 60%

Cavities(inclusions) in cast materials

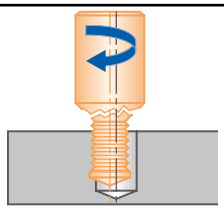
- Reduce bore feed rate by 40-60%

Note:
The application details given depend on the environmental and application conditions (e.g. machine, ambient temperature, lubricant/coolant used and machining result required): they are based on the correct application conditions, correct use and compliance with the spindle speed limits given for the tools.

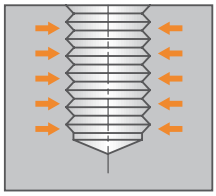
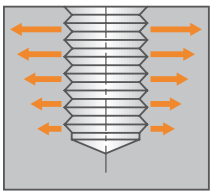
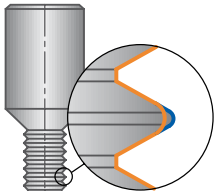
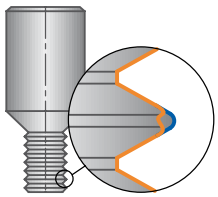
Problems – causes – solutions – drill thread milling tools

Problem		Cause	Solution
Chips packed or glued at the thread profile		- Poor coolant	- Improve coolant (i.e. add flood coolant, lateral flute coolant supply for through holes) - Add coolant flutes flutes on shank
Thread go-gage doesn't fit		- Thread too small - Chips in thread	- Reduce tool radius in offset register - Improve coolant
Thread is getting tapered		- Poor tool clamping - thread milling feed too high	- Improve tool holding (i.e. shrink fit holders) - reduce thread milling feed - radial cut division
Erratic tool wear		- Tool run out too high	- Use better tool holders (i.e. shrink fit holders) Check material for homogeneity
Counterbore chips are winding around the tool		- Chamfer feed too low	- Increase chamfer feed
Loud drilling noise (especially towards the final drilling depth)		- Chip problem	- Reduce drill feed rate - Use tool with coolant through - Add peck cycle
Tool breakage while drilling (especially in long chipping materials)		- Chip problem	- Reduce drill feed rate - Use tools with coolant through - Add peck cycle (multiple pecks)
Chips glued up in the flutes		- Poor coolant	- Improve coolant situation - Use tool with coolant through - Use coated tool - degressive peck cycle

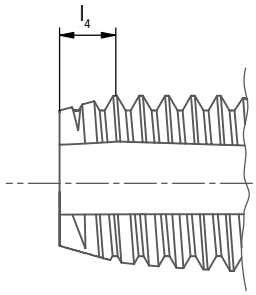
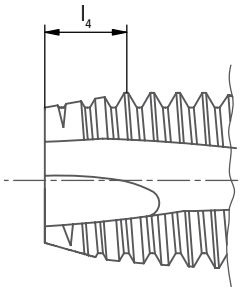
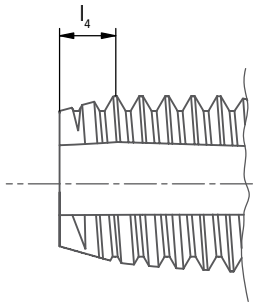
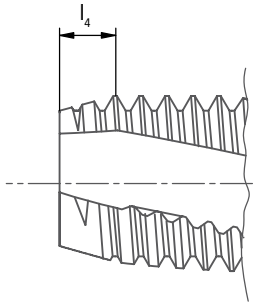
Problems – causes – solutions – drill thread milling tools

Problem		Cause	Solution
Chippage,tool breakage while thread milling		- Feed rate thread milling too high - Vibrations	- Check that the chip grooves are free of chips after the boring operation - Reduce feed rate (check whether NC feeds relate to centre point or external track)
Poor thread surface (harmonics)		- Vibrations	- Check tool holder (do not use modular systems !) - Check workpiece clamping and fixture. Where the clamping set-up is unstable introduce a distribution of the cutting force. - Reduce cutting speed - Increase tooth feed rate - Introduce distribution of cutting force

Problems – causes – solutions – thread milling tools

Problem		Cause	Solution
Chips packed or glued at the thread profile		- Poor coolant	- Improve coolant situation (i.e. add flood coolant, lateral flute coolant supply for through holes) - Add coolant flutes on shank
Thread go-gage doesn't fit		- Thread too small - Chips in thread	- Reduce tool radius in offset register - Improve coolant
Thread is getting tapered		- Poor tool clamping - Thread milling feed too high	- Improve tool holding (i.e. shrink fit holders) - Reduce thread milling feed - radial cut division
Erratic tool wear		- Tool run out too high	- Use better tool holders (i.e. shrink fit holders) - Check material for homogeneity
Chippage, tool breakage		- Feed rate thread milling too high - Vibrations	- Reduce thread milling feed - Check tool holder (don't use modular systems!!) Change feeds and speeds
Poor thread surface		- Tool overhang too long - Non-suitable tool for this application	- Check part clamping an and fixture. Use multiple cuts when part is clamped weak. - Reduce cutting speed, increase feed/tooth, prefer conventional milling

Chamfer Forms – Taps

Chamfer form	No. of threads l_4	Illustration	Type of flute	Application mainly for
A	6 to 8		straight flutes	short through hole threads
B	3,5 to 5,5		straight flutes spiral point	through hole threads
C	2 to 3		straight or helical flutes	blind and through hole threads in short chipping materials
D	3,5 to 5			blind hole threads with long thread run-out (plug tap) and through hole threads
E	1,5 to 2			blind hole threads with short thread run-out (bottoming taps)

Tap drill diameters for milled and cut threads

M	Metric Thread		
Size	**Nom. Ø**	**Pitch**	**Tap drill Ø**
M 1,8	1,8	0,35	1,45
M 2	2	0,40	1,60
M 2,2	2,2	0,45	1,75
M 2,5	2,5	0,45	2,05
M 3	3	0,50	2,50
M 3,5	3,5	0,60	2,90
M 4	4	0,70	3,30
M 4,5	4,5	0,75	3,70
M 5	5	0,80	4,20
M 6	6	1,00	5,00
M 7	7	1,00	6,00
M 8	8	1,25	6,80
M 9	9	1,25	7,80
M10	10	1,50	8,50
M11	11	1,50	9,50
M12	12	1,75	10,20
M14	14	2,00	12,00
M16	16	2,00	14,00
M18	18	2,50	15,50
M20	20	2,50	17,50
M22	22	2,50	19,50
M24	24	3,00	21,00
M27	27	3,00	24,00
M30	30	3,50	26,50
M33	33	3,50	29,50
M36	36	4,00	32,00
M39	39	4,00	35,00
M42	42	4,50	37,50
M45	45	4,50	40,50
M48	48	5,00	43,00
M52	52	5,00	47,00
M56	56	5,50	50,50
M60	60	5,50	54,50
M64	64	6,00	58,00

Tap drill diameters for milled and cut threads

MF	Metric Fine Thread		
Size	Nom. Ø	Pitch	Tap drill Ø
M 2,5x0,35	2,5	0,35	2,15
M 3x0,35	3	0,35	2,65
M 3,5x0,35	3,5	0,35	3,15
M 4x0,5	4	0,50	3,50
M 5x0,5	5	0,50	4,50
M 6x0,5	6	0,50	5,50
M 6x0,75	6	0,75	5,30
M 8x0,5	8	0,50	7,50
M 8x0,75	8	0,75	7,30
M 8x1	8	1,00	7,00
M10x0,75	10	0,75	9,30
M10x1	10	1,00	9,00
M12x1	12	1,00	11,00
M12x1,5	12	1,50	10,50
M14x1	14	1,00	13,00
M14x1,5	14	1,50	12,50
M15x1,5	15	1,50	13,50
M16x1	16	1,00	15,00
M16x1,5	16	1,50	14,50
M17x1,5	17	1,50	15,50
M18x1	18	1,00	17,00
M18x1,5	18	1,50	16,50
M18x2	18	2,00	16,00
M20x1	20	1,00	19,00
M20x1,5	20	1,50	18,50
M20x2	20	2,00	18,00
M22x1	22	1,00	21,00
M22x1,5	22	1,50	20,50
M22x2	22	2,00	20,00
M24x1	24	1,00	23,00
M24x1,5	24	1,50	22,50
M24x2	24	2,00	22,00
M30x1,5	30	1,50	28,50
M30x2	30	2,00	28,00
M30x3	30	3,00	27,00
M33x1,5	33	1,50	31,50
M33x2	33	2,00	31,00
M33x3	33	3,00	30,00
M36x1,5	36	1,50	34,50
M36x2	36	2,00	34,00
M36x3	36	3,00	33,00
M40x1,5	40	1,50	38,50
M40x2	40	2,00	38,00
M40x3	40	3,00	37,00
M42x1,5	42	1,50	40,50
M42x2	42	2,00	40,00
M42x3	42	3,00	39,00
M48x1,5	48	1,50	46,50
M48x2	48	2,00	46,00
M48x3	48	3,00	45,00
M48x4	48	4,00	44,00

MF	Metric Fine Thread		
Size	Nom. Ø	Pitch	Tap drill Ø
M50x1,5	50	1,50	48,50
M50x2	50	2,00	48,00
M50x3	50	3,00	47,00
M56x2	56	2,00	54,00
M56x4	56	4,00	52,00
M60x1,5	60	1,50	58,50
M60x2	60	2,00	58,00
M60x3	60	3,00	57,00
M60x4	60	4,00	56,00
M64x1,5	64	1,50	62,50
M64x2	64	2,00	62,00
M64x3	64	3,00	61,00
M64x4	64	4,00	60,00
M72x2	72	2,00	70,00
M72x3	72	3,00	69,00
M72x4	72	4,00	68,00
M72x6	72	6,00	66,00
M80x2	80	2,00	78,00
M80x4	80	4,00	76,00
M80x6	80	6,00	74,00
M90x2	90	2,00	88,00
M90x4	90	4,00	86,00
M90x6	90	6,00	84,00
M95x2	95	2,00	93,00
M95x6	95	6,00	89,00
M100x6	100	6,00	94,00

Tap drill diameters for milled and cut threads

UNC	American Unified Coarse Thread		
Size	**Nom. Ø**	**Pitch t.p.i.**	**Tap drill Ø**
Nr. 4	2,845	40	2,35
Nr. 5	3,175	40	2,65
Nr. 6	3,505	32	2,85
Nr. 8	4,166	32	3,50
Nr. 10	4,820	24	3,90
Nr. 12	5,486	24	4,50
1/4	6,350	20	5,10
5/16	7,938	18	6,60
3/8	9,525	16	8,00
7/16	11,112	14	9,40
1/2	12,700	13	10,80
9/16	14,288	12	12,20
5/8	15,875	11	13,50
3/4	19,050	10	16,50
7/8	22,225	9	19,50
1"	25,400	8	22,50
1 1/8"	28,575	7	25,00
1 1/4"	31,750	7	28,00
1 3/8"	34,925	6	30,75
1 1/2"	38,100	6	34,00
1 3/4"	44,450	5	39,50
2"	50,800	4 1/2	45,00

UNF	American Unified Fine Thread		
Size	**Nom. Ø**	**Pitch t.p.i.**	**Tap drill Ø**
Nr. 4	2,845	48	2,30
Nr. 5	3,175	44	2,60
Nr. 6	3,505	40	2,85
Nr. 8	4,166	36	3,45
Nr. 10	4,826	32	4,05
Nr. 12	5,486	28	4,60
1/4	6,350	28	5,45
5/16	7,938	24	6,90
3/8	9,525	24	8,45
7/16	11,112	20	9,85
1/2	12,700	20	11,45
9/16	14,288	18	12,90
5/8	15,875	18	14,45
3/4	19,050	16	17,45
7/8	22,225	14	20,40
1"	25,400	12	23,30
1 1/8"	28,575	12	26,45
1 1/4"	31,750	12	29,65
1 3/8"	34,925	12	32,80
1 1/2"	38,100	12	36,00

UNEF	American Unified Extra Fine Thread		
Size	**Nom. Ø**	**Pitch t.p.i.**	**Tap drill Ø**
Nr. 12	5,486	32	4,75
1/4	6,350	32	5,55
5/16	7,938	32	7,15
3/8	9,525	32	8,70
7/16	11,112	28	10,20
1/2	12,700	28	11,80
9/16	14,288	24	13,20
5/8	15,875	24	14,80
11/16	17,462	24	16,40
3/4	19,050	20	17,80
13/16	20,637	20	19,40
7/8	22,225	20	20,95
15/16	23,812	20	22,50
1"	25,400	20	24,15
1 1/16"	26,987	18	25,60
1 1/8"	28,575	18	27,20
1 3/16"	30,162	18	28,75
1 1/4"	31,750	18	30,35
1 5/16"	33,337	18	31,95
1 3/8"	34,925	18	33,50
1 7/16"	36,512	18	35,10
1 1/2"	38,100	18	36,70

W	Whitworth Thread		
Size	**Nom. Ø**	**Pitch t.p.i.**	**Tap drill Ø**
1/8"	3,175	40	2,60
3/16"	4,762	24	3,60
1/4"	6,350	20	5,10
5/16"	7,938	18	6,50
3/8"	9,525	16	7,90
7/16"	11,113	14	9,25
1/2"	12,700	12	10,50
5/8"	15,876	11	13,50
3/4"	19,051	10	16,50
7/8"	22,226	9	19,25
1"	25,401	8	22,00
1 1/8"	28,576	7	24,75
1 1/4"	31,751	7	27,75
1 3/8"	34,926	6	30,50
1 1/2"	38,101	6	33,50
1 5/8"	41,277	5	35,50
1 3/4"	44,452	5	39,00
1 7/8"	47,627	41/2	41,50
2	50,802	41/2	44,50

Tap drill diameters for milled and cut threads

G	Pipe Thread DIN EN ISO 228		
Size	**Nom. Ø**	**Pitch t.p.i.**	**Tap drill Ø**
G 1/8"	9,728	28	8,90
G 1/4"	13,157	19	11,70
G 3/8"	16,662	19	15,40
G 1/2"	20,955	14	19,10
G 5/8"	22,911	14	21,10
G 3/4"	26,441	14	24,60
G 7/8"	30,201	14	28,40
G 1"	33,249	11	30,80
G 1 1/8"	37,897	11	35,50
G 1 1/4"	41,910	11	39,50
G 1 3/8"	44,323	11	41,90
G 1 1/2"	47,803	11	45,40
G 1 3/4"	53,746	11	51,40
G 2"	59,614	11	57,20
G 2 1/4"	65,710	11	63,20
G 2 1/2"	75,184	11	72,80
G 2 3/4"	81,834	11	79,10
G 3"	87,884	11	85,50

RP	ISO 7/1, DIN 2999-1, DIN EN 10226-1		
Size	**Nom. Ø**	**Pitch t.p.i.**	**Tap drill Ø**
RP 1/16	7,723	28	6,55
RP 1/8	9,728	28	8,60
RP 1/4	13,157	19	11,50
RP 3/8	16,662	19	15,00
RP 1/2	20,955	14	18,50
RP 3/4	26,441	14	24,00
RP 1"	33,249	11	30,25
RP 1 1/4"	41,910	11	39,00
RP 1 1/2"	47,803	11	44,85
RP 2"	59,614	11	56,50

BSF	Whitworth Fine Thread		
Size	**Nom. Ø**	**Pitch t.p.i.**	**Tap drill Ø**
1/4"	6,350	26	5,30
9/32"	7,142	26	6,10
5/16"	7,938	22	6,80
3/8"	9,525	20	8,30
7/16"	11,113	18	9,70
1/2"	12,700	16	11,10
9/16"	14,288	16	12,70
5/8"	15,875	14	14,00
11/16"	17,463	14	15,50
3/4"	19,050	12	16,75
13/16"	20,638	12	18,50
7/8"	22,225	11	19,75
1"	25,400	10	22,75
1 1/8"	28,575	9	25,50
1 1/4"	31,750	9	28,75
1 3/8"	34,925	8	31,50
1 1/2"	38,100	8	34,80
1 5/8"	41,275	8	38,00
1 3/4"	44,450	7	40,50
2"	50,800	7	47,00

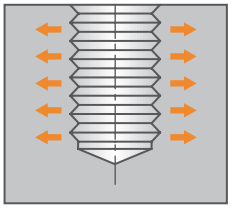
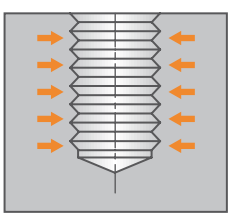
NPSF	American Cylindrical Pipe Thread		
Size	**Nom. Ø**	**Pitch t.p.i.**	**Tap drill Ø**
NPSF 1/16	7,582	27	6,35
NPSF 1/8	9,929	27	8,75
NPSF 1/4	13,236	18	11,30
NPSF 3/8	16,673	18	14,75
NPSF 1/2	20,819	14	18,20
NPSF 3/4	26,166	14	23,50
NPSF 1"	32,718	11/2	29,50

Tap drill diameters for milled and cut threads

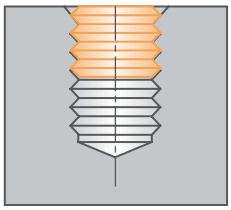
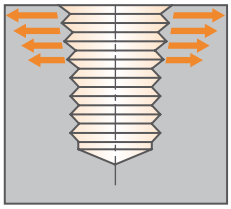
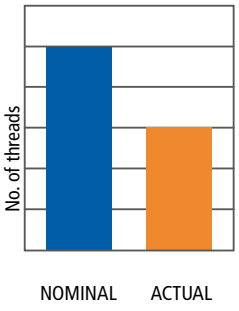
NPT/NPTF	without using a reamer		
Size	**Pitch t.p.i.**	**Tap drill Ø NPT**	**Tap drill Ø NPTF**
1/16	27	6,15	6,10
1/8	27	8,50	8,45
1/4	18	11,00	10,90
3/8	18	14,50	14,30
1/2	14	17,85	17,60
3/4	14	23,20	23,00
1"	11 1/2	29,00	28,75
1 1/4"	11 1/2	37,80	37,50
1 1/2"	11 1/2	44,00	43,75
2"	11 1/2	56,00	55,75

RC	without using a reamer		
Size	**Pitch t.p.i.**	**Tap drill Ø**	
RC 1/16	28	6,20	
RC 1/8	28	8,20	
RP 1/4	19	11,00	
RC 3/8	19	14,50	
RC 1/2	14	18,00	
RC 3/4	14	23,50	
RC 1"	11	29,50	
RC 1 1/4"	11	38,25	
RC 1 1/2"	11	44,25	
RC 2"	11	55,75	
RC 2 1/2"	11	71,25	
RC 3"	11	83,75	

EG	Helical Wire Insert Thread		
Size	**Nom. Ø**	**Pitch**	**Tap drill Ø**
EG M 3	3	0,50	3,15
EG M 3,5	3,5	0,60	3,70
EG M 4	4	0,70	4,20
EG M 4,5	4,5	0,75	4,75
EG M 5	5	0,80	5,25
EG M 6	6	1,00	6,30
EG M 7	7	1,00	7,30
EG M 8	8	1,25	8,40
EG M10	10	1,50	10,50
EG M12	12	1,75	12,50
EG M14	14	2,00	14,50
EG M16	16	2,00	16,50
EG M18	18	2,50	18,75
EG M20	20	2,50	20,75
EG M22	22	2,50	22,75
EG M24	24	3,00	24,75
EG M27	27	3,00	27,75
EG M30	30	3,50	31,00

Problem		Cause	Solution
Oversized thread		- wrong tools - cutting edge geometry not suitable for materials to be machined.	- select the right tools as shown in the JEL catalogue
		- material built-up at tap flanks	- improve coolant system - use coated tap
		- minor diameter too small, tool is cutting full profile	- select correct core diameter
		- chip jam	- blind bore: increase spindle speed. Correct tool selection (spiral flute) - through hole: correct tool selection (spiral point)
		- tolerance of tap drill to thread gauge does not agree	- use tap drill with right tolerance
		- angular or positional error in core bore	- adjust workpiece clamping, use tapping chuck with axis parallel float
Thread too tight		- tolerance of tap drill to thread gauge does not agree	- use tap drill with right tolerance
		- wrong tool type	- select the right tools as shown in the JEL catalogue

Problems – causes – solutions – taps

Problem		Cause	Solution
Thread is cut wrongly axially		- cutting lead pressure on tapping chuck too great	- select the right cutting lead pressure
Pitch distortion (plug gauge cannot be screwed in over full thread length on the workpiece)		- tap is not cutting true to pitch	- select right tool - select right cutting lead pressure - with length adjustment chucks reduce feed to 95%
Thread oversize at the entry		- wrong cutting lead pressure	- use compensation chuck(tension) - use lead srcrew - select right tool
Thread surface not clean		- wrong tool type	- select right tool
		- chip jam	- see "thread too large – chip jam"
		- core diameter too small	- select right core diameter
		- material built-up on thread flanks	- use tools with surface treatment - improve coolant system
		- cutting speed to low	- increase cutting speed
Tool life too short		- wrong tool type	- select right tool type
		- cutting speed too high or too low	- adjust cutting speed
		- composition and supply of coolant inadequate	- provide suitable, sufficient coolant
		- premature wear due to lack of or unsuitable surface treatment	- use coated tools, if necessary solid carbide tools

Tap drill diameters for formed threads

M	Metric Thread		
Size	**Nom. Ø**	**Pitch**	**Tap drill Ø**
M 1,8	1,8	0,35	1,66
M 2	2	0,40	1,84
M 2,2	2,2	0,45	2,02
M 2,5	2,5	0,45	2,32
M 3	3	0,50	2,80
M 3,5	3,5	0,60	3,25
M 4	4	0,70	3,71
M 4,5	4,5	0,75	4,19
M 5	5	0,80	4,67
M 6	6	1,00	5,54
M 7	7	1,00	6,54
M 8	8	1,25	7,43
M 9	9	1,25	8,43
M 10	10	1,50	9,31
M 11	11	1,50	10,31
M 12	12	1,75	11,20
M 14	14	2,00	13,00
M 16	16	2,00	15,00

The tap drill diameters listed are guidelines. The actual tap drill diameters have to be investigated in use as these depend on the fluidity of the material and the forming speed.

MF	Metric Fine Thread		
Size	**Nom. Ø**	**Pitch**	**Tap drill Ø**
M 2,5 x 0,35	2,5	0,35	2,36
M 3 x 0,35	3	0,35	2,86
M 3,5 x 0,35	3,5	0,35	3,36
M 4 x 0,5	4	0,50	3,80
M 5 x 0,5	5	0,50	4,80
M 6 x 0,5	6	0,50	5,80
M 6 x 0,75	6	0,75	5,69
M 8 x 0,5	8	0,50	7,80
M 8 x 0,75	8	0,75	7,69
M 8 x 1	8	1,00	7,54
M 10 x 0,75	10	0,75	9,69
M 10 x 1	10	1,00	9,54
M 12 x 1	12	1,00	11,54
M 12 x 1,5	12	1,50	11,31
M 14 x 1	14	1,00	13,54
M 14 x 1,5	14	1,50	13,31
M 15 x 1,5	15	1,50	14,31
M 16 x 1	16	1,00	15,54
M 16 x 1,5	16	1,50	15,31
M 17 x 1,5	17	1,50	16,31
M 18 x 1	18	1,00	17,54
M 18 x 1,5	18	1,50	17,31
M 18 x 2	18	2,00	17,00

MF	Metric Fine Thread		
Size	**Nom. Ø**	**Pitch**	**Tap drill Ø**
M 20 x 1	20	1,00	19,54
M 20 x 1,5	20	1,50	19,31
M 20 x 2	20	2,00	19,00
M 22 x 1	22	1,00	21,54
M 22 x 1,5	22	1,50	21,31
M 22 x 2	22	2,00	21,00
M 24 x 1	24	1,00	23,54
M 24 x 1,5	24	1,50	23,31
M 24 x 2	24	2,00	23,00
M 30 x 1,5	30	1,50	29,31
M 30 x 2	30	2,00	29,00
M 33 x 1,5	33	1,50	32,31
M 33 x 2	33	2,00	32,00
M 36 x 1,5	36	1,50	35,31
M 36 x 2	36	2,00	35,00

Tap drill diameters for roll formed threads

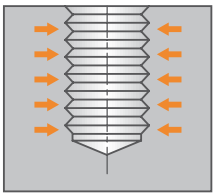
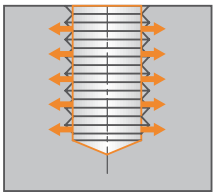
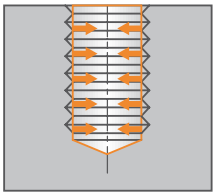
UNC	American Unified Coarse Thread		
Size	**Nom. Ø**	**Pitch t.p.i.**	**Tap drill Ø**
Nr. 4	2,845	40	2,58
Nr. 5	3,175	40	2,91
Nr. 6	3,505	32	3,18
Nr. 8	4,166	32	3,84
Nr. 10	4,820	24	4,33
Nr. 12	5,486	24	5,00
1/4	6,350	20	5,77
5/16	7,938	18	7,29
3/8	9,525	16	8,79
7/16	11,112	14	10,28
1/2	12,700	13	11,80
9/16	14,288	12	13,23

UNF	American Unified Fine Thread		
Size	**Nom. Ø**	**Pitch t.p.i.**	**Tap drill Ø**
Nr. 4	2,845	48	2,63
Nr. 5	3,175	44	2,94
Nr. 6	3,505	40	3,24
Nr. 8	4,166	36	3,88
Nr. 10	4,826	32	4,50
Nr. 12	5,486	28	5,11
1/4	6,350	28	5,98
5/16	7,938	24	7,45
3/8	9,525	24	9,04
7/16	11,112	20	10,53
1/2	12,700	20	12,12
9/16	14,288	18	13,64
5/8	15,875	18	15,23
3/4	19,050	16	18,32
7/8	22,225	14	21,39
1"	25,400	12	24,34
1 1/8"	28,575	12	27,52
1 1/4"	31,750	12	30,69
1 3/8"	34,925	12	33,87
1 1/2"	38,100	12	37,04

The tap drill diameters listed are guidelines. The actual tap drill diameters have to be investigated in use as these depend on the fluidity of the material and the forming speed.

UNEF	American Unified Extra Fine Thread		
Size	**Nom. Ø**	**Pitch t.p.i.**	**Tap drill Ø**
Nr. 12	5,486	32	5,16
1/4	6,350	32	6,02
5/16	7,938	32	7,61
3/8	9,525	32	9,20
7/16	11,112	28	10,74
1/2	12,700	28	12,33
9/16	14,288	24	13,80
5/8	15,875	24	15,39
11/16	17,462	24	16,98
3/4	19,050	20	18,47
13/16	20,637	20	20,05
7/8	22,225	20	21,64
15/16	23,812	20	23,23
1"	25,400	20	24,82
1 1/16"	26,987	18	26,34
1 1/8"	28,575	18	27,93
1 3/16"	30,162	18	29,51
1 1/4"	31,750	18	31,10
1 5/16"	33,337	18	32,69
1 3/8"	34,925	18	34,28
1 7/16"	36,512	18	35,86
1 1/2"	38,100	18	37,45

Problems – causes – solutions – roll form taps

Problem		Cause	Solution
Thread too tight		- tolerance of thread forming tool does not align with thread gauge	- use thread forming tool with right tolerance
Core diameter too large on thread		- wrong drill diameter (too large)	- use smaller drill
Core diameter too small or torque too high		- drill diameter too small	- use larger core boring tool

Hardness comparison table (extract from DIN 50150)

Tensile strength Rm (N/mm²)	Vickers hardness HV	Brinell hardness HB	Rockwell hardness	
			HRC	HRB
350	110	105	_	62
385	120	114	_	67
415	130	124	_	71
450	140	133	_	75
480	150	143	_	79
510	160	152	_	82
545	170	162	_	85
575	180	171	_	87
610	190	181	_	90
640	200	190	_	92
675	210	199	_	94
705	220	209	_	95
740	230	219	_	97
770	240	228	20	98
800	250	238	22	100
835	260	247	24	101
865	270	257	26	102
900	280	266	27	104
930	290	276	29	105
965	300	285	30	_
1030	320	304	32	_
1095	340	323	34	_
1155	360	342	37	_
1220	380	361	39	_
1290	400	380	41	_
1350	420	399	43	_
1420	440	418	45	_
1485	460	437	46	_
1555	480	456	48	_
1595	490	466	48	_
1665	510	485	50	_
1740	530	504	51	_
1810	550	523	52	_
1880	570	542	54	_
1955	590	561	55	_
2030	610	580	56	_
2105	630	599	57	_
2180	650	618	58	_

Torque calculations
for tapping and thread forming

M: torque in Nm

Kc: specific cutting force (N/mm²) as shown in table (see below)

h: thread pitch in mm

D: nominal thread diameter

$$M = \frac{Fct^*}{8000} \times Kc \times h^2 \times D$$

***Factors**

	Tapping	**Thread forming**
New tool	1,0	2,5
Used tool	2,5	3,5

Table for specific cutting force Kc

Material	**Kc value (N/mm²)**
Steel 1000-1300 N/mm²	3600
Steel 800-1000 N/mm²	2600
Steel 600- 850 N/mm²	2500
Steel <600 N/mm²	2300
Stainless steel	3200
Cast bronze	1900
GG-20 (HB 170 (grey cast iron) – **for tapping only**	1600
Malleable Iron- hard	1250
Copper	1100
Malleable Iron- soft	900
Brass (CuZn)	720
Alu-Si alloy	680
Zinc alloy	440

Please see note on page 152

Circular interpolation grooving – A completely new tool concept

Method description:

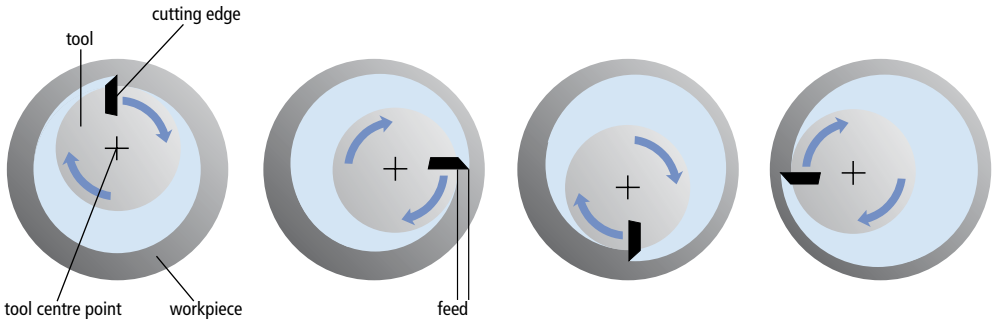
With circular interpolation grooving, the principle of external grooving is transferred from a machining centre to a lathe by programming the machining centre spindle as an axis.
The tool is then moved outwards at grooving depth on a helical interpolation path programmed by the machine control.
At every point on the circular path the cutting edge is vertical to the bore tangent.

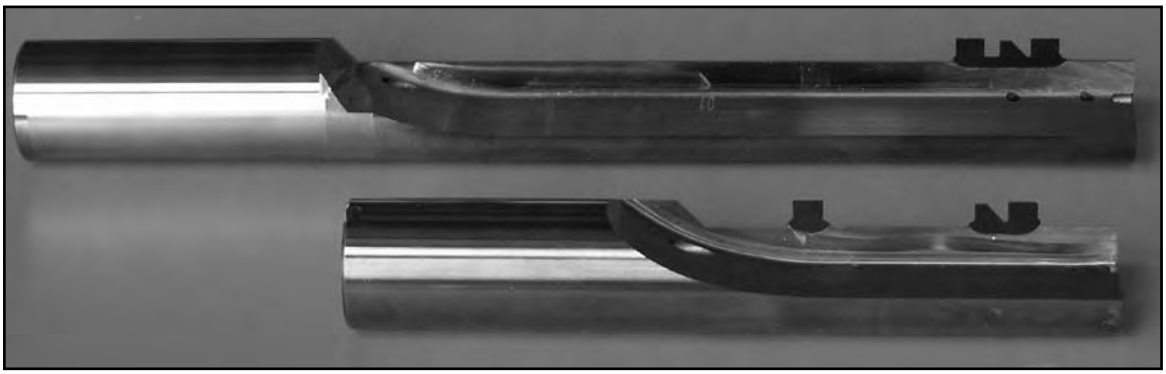
Application areas:

For all internal and external grooves, angled grooves and annular slots.

Tool design:

An extremely wide variety of tool designs specifically matched to the machining task in question.





Please see note on page 152

Tool size	Aluminium/ Alum. alloy	Grey cast iron/ SG cast iron
very small tools	solid carbide mono TiAlN coating	solid carbide mono TiAlN coating
up to Ø 32	solid carbide tool carrier cutting edge PCD tipped	solid carbide tool carrier cutting edge with solid carbide tip TiAlN coating
larger than Ø 32	steel tool carrier PCD brazed cutting edge	steel tool carrier solid carb. brazed cutting edge TiAlN coating

Circular interpolation grooving – A completely new tool concept

Advantages:

- Short cycle times
- Better surface finish than with milling as cutting edge constantly engaged
- High cutting feed settings
- Economic production
- A single tool for roughing and finishing
- Less likelihood of vibrations
- Stable tools because of asymmetric construction, even with an unfavourable diameter to length ratio
- Turning process can be carried out on a machining centre
- Problem-free division of cut for grooves which are particularly deep
- Specially arranged coolant bores guarantee chip removal even from deep grooves
- Circular external grooving allows maximum rigidity in tool design
- Extremely good surface finish in grooves
- Extremely good repeatability of grooves in aluminium,
  e.g. Ø 25 mm up to 5×D <0.001 mm
  up to 8×D <0.015 mm

Machine requirements:

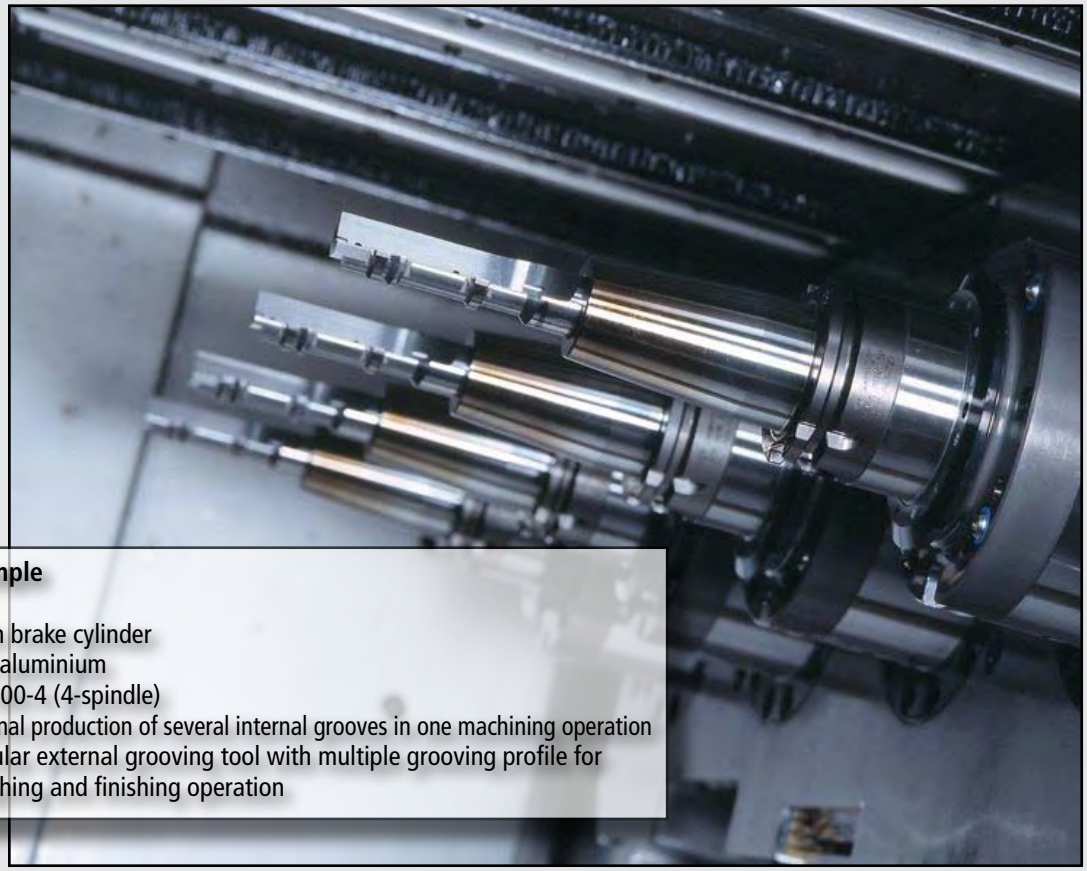
To carry out programming on a machining centre, the machine spindle has to be programmed and controlled as an axis. This is a basic requirement that must be clarified with the relevant machine manufacturer and/or control manufacturer.

Coolant system:

A sufficient high pressure internal coolant system is required for internal grooving subject to the bore depth and the cutting properties of the material.

Cutting data:

Rotation speed of tool centre point:
120 min^{-1} - 360 min^{-1}
(depending on machine)
Cutting speed at cutting edge:
4 m/min - 25 m/min
(depending on machine)
Feed rates (depending on material):
0,03 mm - 0,15 mm

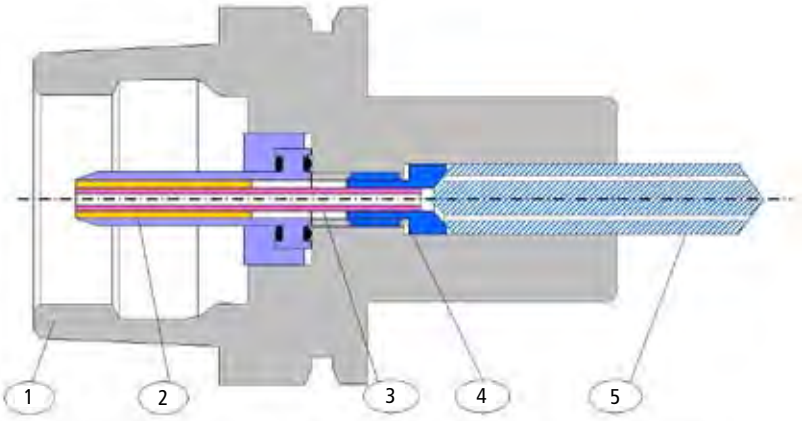


Application example

Workpiece:	Main brake cylinder
Material:	cast aluminium
Machine:	BA 400-4 (4-spindle)
Task:	Internal production of several internal grooves in one machining operation
Tool:	Circular external grooving tool with multiple grooving profile for roughing and finishing operation

MQL (**M**iniumum **Q**uantity **L**ubrication)

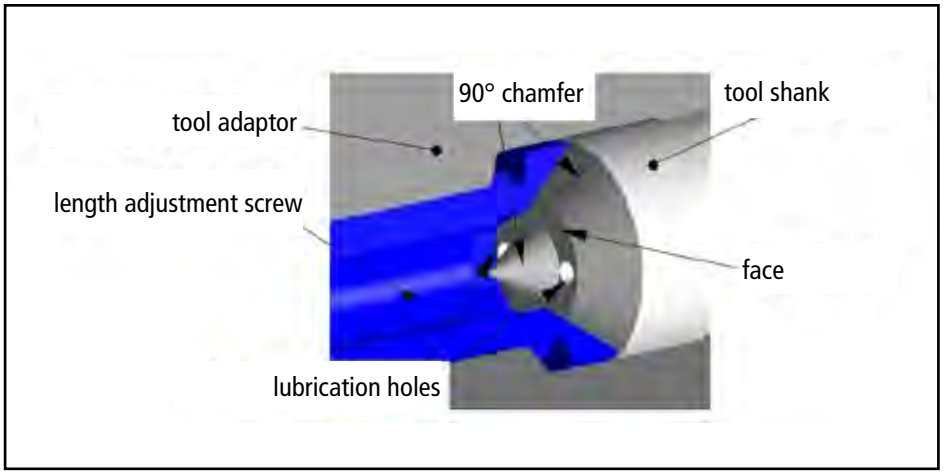
In order to combine the advantages which minimum quantity lubrication can offer in a production system, all the components which make up this system need to be examined and aligned with each other in the best possible way.



1 Tool adaptor
2 Coolant pipe
3 Minimal lubrication pipe
4 Length adjustment screw
5 Tool

Advantages and disadvantages of minimum quantity lubrication	
Advantages:	**Disadvantages:**
No need to dispose of coolant	
No maintenance for coolant and machine	Increased thermal and mechanical stresses on the tool
No thermal shock to the tool	Connections need to be optimised
Better lubricating effect	Tools need to be optimised
Minimum costs for lubricating medium	

When using minimal quantity lubrication it is extremely important to allocate the supply points in the best possible way. This is achieved by using, amongst other things, a special design for the end of the shank on the tools. The best results in numerous trials were achieved using the design shown below.

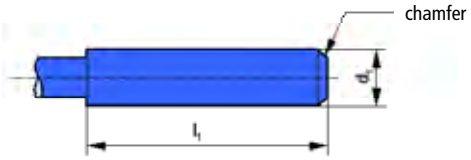


By working continuously with leading MWL system suppliers the KOMET GROUP can also be your partner for applications with minimum quantity lubrication.

Please see note on page 152

Cylindrical shanks for carbide tools
DIN 6535 (extract)

Form HA



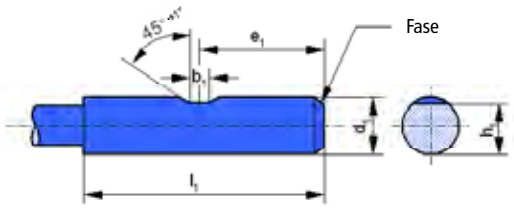
dimensions in [mm]

d_1	l_1 +2 0
2	28
3	28
4	28
5	28
6	36
8	36
10	40
12	45
14	45
16	48
18	48
20	50
25	56
32	60

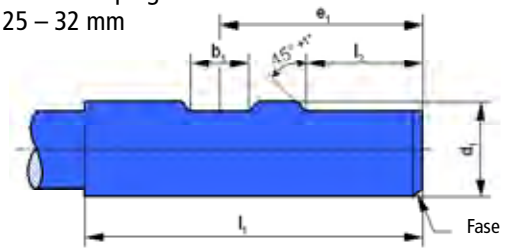
Allocation of tool adaptors :
shrink fit chuck,
hydrydraulic chuck, collet

Form HB

with a clamping flat
d_1: 6 – 20 mm



with two clamping flats
d_1: 25 – 32 mm



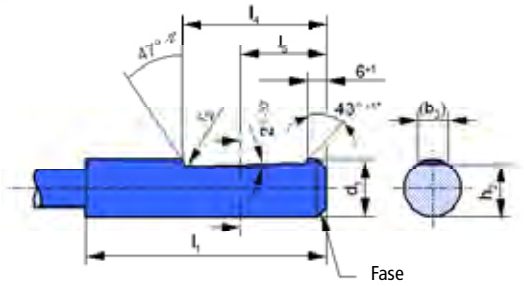
Allocation of tool adaptors:
Weldon chuck (HWD)

dimensions in [mm]

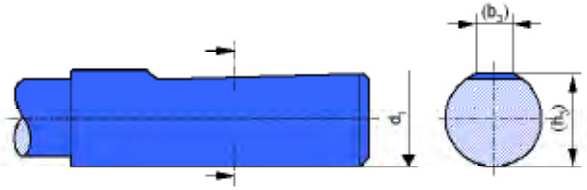
d_1 h6	b_1 +0,05 0	e_1 0 -1	h_1 h11	l_1 +2 0	l_2 +1 0
6	4,2	18	5,1	36	-
8	5,5	18	6,9	36	-
10	7	20	8,5	40	-
12	8	22,5	10,,4	45	-
14	8	22,5	12,7	45	-
16	10	24	14,2	48	-
18	10	24	16,2	48	-
20	11	25	18,2	50	-
25	12	32	23	56	17
32	14	36	30	60	19

Form HE

d1: 6 – 20 mm



d1: 25 – 32 mm



Allocation of tool adaptors:
Whistle Notch chuck (FWD)

dimensions in [mm]

d_1 h6	(b_2) ≈	(b_3)	h_2 h11	(h_3)	l_1 +2 0	l_4 0 -1	l_5 Nom. dim.	r_2 min.
6	4,3	-	5,1	-	36	25	18	1,2
8	5,5	-	6,9	-	36	25	18	1,2
10	7,1	-	8,5	-	40	28	20	1,2
12	8,2	-	10,4	-	45	33	22,5	1,2
14	8,1	-	12,7	-	45	33	22,5	1,2
16	10,1	-	14,2	-	48	36	24	1,6
18	10,8	-	16,2	-	48	36	24	1,6
20	11,4	-	18,2	-	50	38	25	1,6
25	13,6	9,3	23,0	24,1	56	44	32	1,6
32	15,5	9,9	30,0	31,2	60	48	35	1,6

KOMET GROUP Enquiry

Name: _____
Date: _____

KOMET GROUP

Inquiry No.: _____ Contact person KOMET GROUP: _____

Customer: _____
Customer-No: _____
Inquiry-No: _____
Sent quote to: _____
Telephone: _____
Telefax: _____
E-Mail: _____
Department: _____

End user (OEM): _____
Date of visit: _____
Technical contact: _____
Telephone: _____
Telefax: _____
E-Mail: _____

Please offer: _____

Quotation: ☐ Fixed price ☐ Budgetary price
Drawing or sketch required: ☐ yes ☐ no

Due at quotation: _____
Delivery required at: _____
For OEM´s: ☐ Machine already ordered
☐ Order of machine expected
☐ Quotation for project

Batch size of parts to be machined/year: _____

Tools:
Carbide inserts: ☐ Komet ☐ ISO
Max tool weight: (kgs): _____
Max tool width (mm): _____
Max tool length. (mm): _____

Tool change: ☐ automatically ☐ manually
Tool set-up: ☐ inside the machine ☐ outside

Data carrier Type: _____
Type of shank: _____

Part: _____
Material: _____
No. of drawing _____
Tensile strength: _____ Hardness: _____

Machining task:
☐ threading
☐ Pre-machining ☐ Finish machining ☐ core bore ☐ reaming
☐ drilling ☐ Semi finish machining ☐ milling ☐ Other

Stock to remove: _____ mm
Location off centre: _____ mm

Interfirence from component fixture:
☐ none ☐ see sketch
cpk-values: _____

Reaming data:
Diameter and tolerance: _____
Premachining-ø: _____
How pre-machined: _____
Reaming length: _____

Hole type:

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Length of the interruption: _____

Bottom maschined: ☐ yes ☐ no
Surface quality Ra / Rt / Rz: _____
Acceptable circle error: _____

Machine data:
Brand /-type: _____
Year of Mfg.: _____
No. of Spindles: _____

Operation: ☐ horizontally ☐ vertically
Power: P_A (kW) _____
Spindle speed: rpm_{min} _____ ☐ rotating
rpm_{max} _____ ☐ standing

Spindle speed: various ☐ yes ☐ no
Feed drive connection: ☐ NC ☐ hydraulically
Spindle location (e.g. HSK;SK): _____
Spindle runout: _____
Coolant: ☐ Central Through Spindle ☐ dry ☐ MMS

Coolant pressure (bar): _____
Make & concentration: _____

Threading data:
☐ BGF
☐ MGF ☐ MKG ☐ Tomill
☐ Roll form tap ☐ carbide ☐ HSS ☐ carbide tipped
☐ thread-cutting tap ☐ carbide ☐ HSS

Core hole diameter: _____
Depth: _____

Thread depth: _____
Thread length: _____ mm

☐ Blind hole ☐ Through hole

Chamfer: ☐ yes ☐ no

Chamfer angle: _____ degrees

(2nd Site to use for sketchs / machining proposal)

KOMET GROUP Enquiry

Name:

Date:

KOMET GROUP

Inquiry-No.:		Contact person KOMET GROUP:	

Customer:		End user (OEM):	
Customer-No.:		Date of visit:	
Inquiry-No.:		Technical Contact:	
Sent quote to:		Telephone:	
Telephone:		Telefax:	
Telefax:		E-Mail:	
E-Mail:			
Department:			

Please offer:

Recommended cutting data
Thread milling

Guidelines					Thread milling cutters							
					v_c		f_z				v_c	f_z
				Surface	uncoated	TiCN						
				Nominal Ø			≤6 mm	≤12 mm	≥16 mm	≥16 mm		
Material		Material groups	Hardness (HB)	Strength (N/mm²)								
1. Steel	P	1.1 Magnetic soft iron	≤120	≤400		80-150	0,015-0,040	0,040-0,060	0,08-0,15	0,08-0,15	80-100	0,08-0,12
		1.2 Structural, case hardened steel	≤200	≤700		80-100	0,015-0,040	0,040-0,060	0,08-0,15	0,08-0,15	80-100	0,08-0,12
		1.3 Carbon steel	≤250	≤850		80-100	0,015-0,040	0,040-0,060	0,08-0,15	0,08-0,15	80-100	0,08-0,12
		1.4 Alloy steel	≤250	≤850		80-100	0,015-0,040	0,040-0,060	0,08-0,15	0,08-0,15	80-100	0,08-0,12
		1.5 Alloy/heat treated steel	>250, ≤350	>850, ≤1200		60-80	0,010-0,030	0,040-0,060	0,04-0,10	0,04-0,10	60-80	0,04-0,08
		1.6 Alloy/heat treated steel	>350	>1200		50-60	0,010-0,025	0,030-0,050	0,04-0,10	0,04-0,10	50-60	0,04-0,08
	H	1.7 Hardened steel to 45 HRC	≤400	≤1400		30-50	0,010-0,015	0,015-0,020	0,03-0,08	0,03-0,08		
		1.8 Hardened steel to 58 HRC	≤600	≤2200		20-40	0,010-0,015	0,015-0,020				
2. Stainless steel	M	2.1 Stainless steel, sulphuretted	≤250	≤850		60-80	0,015-0,030	0,030-0,050	0,08-0,15	0,08-0,15	60-80	0,04-0,08
		2.2 Austentic	≤250	≤850		60-80	0,015-0,030	0,030-0,050	0,04-0,10	0,04-0,10	60-80	0,04-0,08
		2.3 Ferritic, ferritic & austentic, martensitic	≤300	≤1000		60-80	0,010-0,025	0,020-0,040	0,04-0,10	0,04-0,10	60-80	0,04-0,08
3. Cast iron	K	3.1 Grey cast iron	≤150	≤500	50-80	80-120	0,020-0,040	0,040-0,100	0,08-0,15	0,08-0,15	80-120	0,08-0,15
		3.2 Grey cast iron , heat treated	>150, ≤300	>500, ≤1000	50-80	80-120	0,020-0,030	0,040-0,080	0,08-0,12	0,08-0,12	80-120	0,08-0,15
		3.3 Vermicular cast iron	200-250	400-500		80-100	0,020-0,040	0,040-0,080	0,08-0,15	0,08-0,15	80-100	0,08-0,15
		3.4 Spher. graph. cast iron	≤200	≤700		80-120	0,020-0,040	0,040-0,100	0,08-0,15	0,08-0,15	80-120	0,08-0,15
		3.5 Spher. graph. cast iron, heat treated	>200, ≤300	>700, ≤1000		80-100	0,020-0,030	0,040-0,080	0,08-0,12	0,08-0,12	80-120	0,08-0,15
		3.6 Malleable iron	≤200	≤700		80-100	0,020-0,040	0,040-0,100	0,08-0,15	0,08-0,15	80-120	0,08-0,15
		3.7 Malleable iron, heat treated	>200, ≤300	>700, <1000		80-100	0,020-0,030	0,040-0,080	0,08-0,12	0,08-0,12	80-120	0,08-0,15
4. Titanium	S	4.1 Pure titanium	≤200	≤700		40-100	0,015-0,030	0,030-0,080	0,08-0,15	0,08-0,15	40-80	0,04-0,08
		4.2 Titanium alloys	≤270	≤900		40-100	0,015-0,030	0,030-0,080	0,08-0,15	0,08-0,15	40-80	0,04-0,08
		4.3 Titanium alloys	>270, ≤300	>900, ≤1250		40-80	0,015-0,020	0,030-0,060	0,08-0,12	0,08-0,12	40-80	0,04-0,08
5. Nickel		5.1 Pure nickel	≤150	≤500		50-60	0,020-0,040	0,040-0,060	0,04-0,10	0,04-0,10	20-40	0,04-0,06
		5.2 Nickel alloys, heat resistant	<270	≤900		30-40	0,020-0,040	0,040-0,060	0,04-0,10	0,04-0,10	20-40	0,04-0,06
		5.3 Nickel alloys, high heat resistance	>270, ≤350	>900, ≤1200		10-30	0,015-0,030	0,030-0,050	0,04-0,08	0,04-0,08	20-40	0,04-0,06
6. Copper	N	6.1 Non-alloy copper	≤100	≤350	100-300	100-400	0,040-0,070	0,070-0,120	0,10-0,20	0,10-0,20	100-300	0,10-0,15
		6.2 short chip, brass, bronze, red brass	≤200	≤700	100-300	100-400	0,040-0,070	0,070-0,120	0,10-0,20	0,10-0,20	100-300	0,10-0,15
		6.3 long chip brass	≤200	≤700	100-300	100-400	0,040-0,070	0,070-0,120	0,10-0,20	0,10-0,20	100-300	0,10-0,15
		6.4 Cu-Al-Fe alloy (Ampco)	≤470	≤500	60-80	60-80	0,020-0,040	0,030-0,060	0,08-0,15	0,08-0,15		
7. Aluminium/ Magnesium		7.1 Alu, Mg non-alloy	≤100	≤350	100-400	100-400	0,030-0,070	0,070-0,120	0,10-0,20	0,10-0,20	100-400	0,10-0,15
		7.2 Alu wrought alloy, breaking strain (A 5) <14 %	≤180	≤600	100-400	100-400	0,030-0,070	0,070-0,120	0,10-0,20	0,10-0,20	100-400	0,10-0,15
		7.3 Alu wrought alloy, breaking strain (A 5) ≥14 %	≤180	≤600	100-400	100-400	0,030-0,070	0,070-0,120	0,10-0,20	0,10-0,20	100-400	0,10-0,15
		7.4 Alu cast alloy, Si <10 %	<180	≤600	100-300	100-400	0,030-0,070	0,070-0,120	0,10-0,20	0,10-0,20	100-400	0,15-0,20
		7.5 Alu cast alloy, Si ≥10 %	≤180	≤600	100-200	100-250	0,030-0,070	0,070-0,120	0,10-0,20	0,10-0,20	100-400	0,15-0,20
8. Plastics		8.1 Thermoplastics			80-100	100-120	0,040-0,060	0,060-0,120	0,08-0,20	0,08-0,20	100-120	0,10-0,20
		8.2 Thermosetting plastics			80-100	100-120	0,040-0,060	0,060-0,120	0,08-0,15	0,08-0,15	100-120	0,10-0,15
		8.3 Fibre reinforced plastics			50-60	60-80	0,040-0,060	0,060-0,120	0,08-0,15	0,08-0,15	60-80	0,10-0,15

v_c = Cutting speed in mm
f_z = Milling feed in mm/tooth
For PCD thread milling tools see page 157 - boring and PCD tools

CNC programs can be configured on line at http://tpt.kometgroup.com or can be obtained on request from tel.: +49 (0) 711 78891-0

Note:
The application details given depend on the environmental and application conditions (e.g. machine, ambient temperature, lubricant/coolant used and machining result required): they are based on the correct application conditions, correct use and compliance with the spindle speed limits given for the tools.

Recommended cutting data
Drill thread milling

JEL

Guidelines				Drill thread milling cutters										
				v_c		f_b		f_z		v_c	f_b	f_z	v_c	f_z
			Surface	unc.	TiAlN					AlCrN			TiAlN	
			Nominal Ø			≤6 mm	≤12 mm	≤6 mm	≤12 mm					
Material	Material groups	Hardness (HB)	Strength (N/mm²)											
1. Steel	P	1.1 Magnetic soft iron	≤120	≤400										100-150	0,03-0,10
		1.2 Structural, case hardened steel	≤200	≤700										100-150	0,03-0,10
		1.3 Carbon steel	≤250	≤850										100-150	0,03-0,10
		1.4 Alloy steel	≤250	≤850										100-150	0,03-0,10
		1.5 Alloy/heat treated steel	>250, ≤350	>850, ≤1200										100-150	0,03-0,10
		1.6 Alloy/heat treated steel	>350	>1200										100-150	0,03-0,10
	H	1.7 Hardened steel to 45 HRC	≤400	≤1400											
		1.8 Hardened steel to 58 HRC	≤600	≤2200											
2. Stainless steel	M	2.1 Stainless steel, sulphuretted	≤250	≤850											
		2.2 Austentic	≤250	≤850											
		2.3 Ferritic, ferritic & austentic, martensitic	≤300	≤1000											
3. Cast iron	K	3.1 Grey cast iron	≤150	≤500	50-80	80-120	0,10-0,15	0,15-0,22	0,02-0,05	0,05-0,10	80-120	0,15-0,22	0,05-0,10	100-200	0,05-0,15
		3.2 Grey cast iron , heat treated	>150, ≤300	>500, ≤1000	50-80	80-120	0,10-0,15	0,15-0,22	0,02-0,05	0,05-0,10	80-120	0,15-0,22	0,05-0,10	100-200	0,05-0,15
		3.3 Vermicular cast iron	200-250	400-500		80-100	0,10-0,15	0,15-0,22	0,02-0,05	0,05-0,10				100-150	0,05-0,15
		3.4 Spher. graph. cast iron	≤200	≤700	50-80	80-120	0,10-0,15	0,15-0,22	0,02-0,05	0,05-0,10				100-200	0,05-0,15
		3.5 Spher. graph. cast iron, heat treated	>200, ≤300	>700, ≤1000										100-200	0,05-0,15
		3.6 Malleable iron	≤200	≤700										100-200	0,05-0,15
		3.7 Malleable iron, heat treated	>200, ≤300	>700, <1000										100-200	0,05-0,15
4. Titanium	S	4.1 Pure titanium	≤200	≤700											
		4.2 Titanium alloys	≤270	≤900											
		4.3 Titanium alloys	>270, ≤300	>900, ≤1250											
5. Nickel		5.1 Pure nickel	≤150	≤500											
		5.2 Nickel alloys, heat resistant	<270	≤900											
		5.3 Nickel alloys, high heat resistance	>270, ≤350	>900, ≤1200											
6. Copper	N	6.1 Non-alloy copper	≤100	≤350											
		6.2 short chip, brass, bronze, red brass	≤200	≤700	100-300		0,10-0,30	0,06-0,10	0,03-0,06	0,06-0,10				100-200	0,05-0,15
		6.3 long chip brass	≤200	≤700										100-200	0,05-0,15
		6.4 Cu-Al-Fe alloy (Ampco)	≤470	≤500											
7. Aluminium/ Magnesium		7.1 Alu, Mg non-alloy	≤100	≤350	100-400	100-400	0,10-0,25	0,25-0,30	0,03-0,06	0,06-0,10				100-400	0,05-0,20
		7.2 Alu wrought alloy, breaking strain (A 5) <14 %	≤180	≤600	100-400	100-400	0,10-0,25	0,25-0,30	0,03-0,06	0,06-0,10				100-400	0,05-0,20
		7.3 Alu wrought alloy, breaking strain (A 5) ≥14 %	≤180	≤600	100-400	100-400	0,03-0,06	0,06-0,12	0,03-0,06	0,06-0,10				100-400	0,05-0,20
		7.4 Alu cast alloy, Si <10 %	<180	≤600	100-300	100-400	0,10-0,25	0,25-0,30	0,03-0,06	0,06-0,10				100-400	0,05-0,20
		7.5 Alu cast alloy, Si ≥10 %	≤180	≤600		100-300	0,10-0,25	0,25-0,30	0,03-0,06	0,06-0,10				100-300	0,05-0,20
8. Plastics		8.1 Thermoplastics			60-120	60-120	0,10-0,25	0,25-0,30	0,03-0,06	0,06-0,10				100-200	0,05-0,20
		8.2 Thermosetting plastics			60-100	60-100	0,10-0,25	0,25-0,30	0,03-0,06	0,06-0,10				100-200	0,05-0,20
		8.3 Fibre reinforced plastics			40-60	60-80	0,10-0,15	0,15-0,22	0,02-0,05	0,05-0,10				100-150	0,05-0,20

v_c = Cutting speed in mm
f_b = Drilling feed in mm/rev.
f_z = Milling feed in mm/tooth

CNC programs can be configured on line at http://tpt.kometgroup.com or can be obtained on request from tel.: +49 (0) 711 78891-0

Note:
The application details given depend on the environmental and application conditions (e.g. machine, ambient temperature, lubricant/coolant used and machining result required): they are based on the correct application conditions, correct use and compliance with the spindle speed limits given for the tools.

Recommended cutting data
Tapping

Guidelines – Cutting speed in m/min					Taps				
				Cutting material	HSS		Solid carbide		
				Surface	uncoated	coated	uncoated	coated	Coolant
Material		Material groups	Hardness (HB)	Strength (N/mm²)					E = Emulsion O = Oil T= Dry L = Air
1. Steel	P	1.1 Magnetic soft iron	≤120	≤400	15-30	20-50			E/O
		1.2 Structural, case hardened steel	≤200	≤700	15-25	20-40			E/O
		1.3 Carbon steel	≤250	≤850	15-20	20-35			E/O
		1.4 Alloy steel	≤250	≤850	10-15	20-30			E/O
		1.5 Alloy/heat treated steel	>250, ≤350	>850, ≤1200	5-10	15-20			O/E
		1.6 Alloy/heat treated steel	>350	>1200	2-5	10-15			O
	H	1.7 Hardened steel to 45 HRC	≤400	≤1400				2-8	O
		1.8 Hardened steel to 58 HRC	≤600	≤2200				2-5	O
2. Stainless steel	M	2.1 Stainless steel, sulphuretted	≤250	≤850	5-10	10-25			O
		2.2 Austentic	≤250	≤850	4-8	10-20			O
		2.3 Ferritic, ferritic & austentic, martensitic	≤300	≤1000	3-5	7-12			O
3. Cast iron	K	3.1 Grey cast iron	≤150	≤500	10-20	20-25	20-50		E/T
		3.2 Grey cast iron , heat treated	>150, ≤300	>500, ≤1000	5-10	15-20	20-50		E
		3.3 Vermicular cast iron	200-250	400-500					
		3.4 Spher. graph. cast iron	≤200	≤700	10-20	20-40	20-50		E
		3.5 Spher. graph. cast iron, heat treated	>200, ≤300	>700, ≤1000	5-10	10-15	20-50		E/O
		3.6 Malleable iron	≤200	≤700	10-15	30-40	20-50		E/O
		3.7 Malleable iron, heat treated	>200, ≤300	>700, <1000	5-10	10-20	20-50		E/O
4. Titanium	S	4.1 Pure titanium	≤200	≤700	5-15	10-15			E/O
		4.2 Titanium alloys	≤270	≤900	3-10	10-15			E/O
		4.3 Titanium alloys	>270, ≤300	>900, ≤1250	1-5	5-10			O
5. Nickel		5.1 Pure nickel	≤150	≤500	7-10	10-15			O
		5.2 Nickel alloys, heat resistant	<270	≤900	4-8	5-10			O
		5.3 Nickel alloys, high heat resistance	>270, ≤350	>900, ≤1200	3-5	4-7			O
6. Copper	N	6.1 Non-alloy copper	≤100	≤350	10-15	15-20			E/O
		6.2 short chip, brass, bronze, red brass	≤200	≤700	25-30	40-50	25-60		E/T
		6.3 long chip brass	≤200	≤700	10-20	30-40			E/O
		6.4 Cu-Al-Fe alloy (Ampco)	≤470	≤500	2-5	5-8	5-9		E/O
7. Aluminium/ Magnesium		7.1 Alu, Mg non-alloy	≤100	≤350	10-15	20-50			E
		7.2 Alu wrought alloy, breaking strain (A 5) <14 %	≤180	≤600	15-20	20-40			E
		7.3 Alu wrought alloy, breaking strain (A 5) ≥14 %	≤180	≤600	10-15	20-40			E
		7.4 Alu cast alloy, Si <10 %	<180	≤600	20-30	25-50	25-80		E
		7.5 Alu cast alloy, Si ≥10 %	≤180	≤600	15-25	20-30	20-60		E
8. Plastics		8.1 Thermoplastics			15-25	20-30			E/T
		8.2 Thermosetting plastics			5-10	10-15	10-30		E/L
		8.3 Fibre reinforced plastics			3-5	8-12	8-25		E

Note:
The application details given depend on the environmental and application conditions (e.g. machine, ambient temperature, lubricant/coolant used and machining result required): they are based on the correct application conditions, correct use and compliance with the spindle speed limits given for the tools.

Recommended cutting data
Thread forming

[1] HSS-E with carbide strips

Guidelines – Cutting speed in m/min					Roll form taps				
				Cutting material	HSS		Solid carbide/HML[1]		
				Surface	nitrided	coated	uncoated	coated	Coolant
Material		Material groups	Hardness (HB)	Strength (N/mm²)					E = Emulsion O = Oil T= Dry L = Air
1. Steel	P	1.1 Magnetic soft iron	≤120	≤400	30-40	30-50		30-80	E/O
		1.2 Structural, case hardened steel	≤200	≤700	25-35	30-50		30-80	E/O
		1.3 Carbon steel	≤250	≤850	20-30	30-50		30-80	E/O
		1.4 Alloy steel	≤250	≤850	20-25	20-30		20-50	O
		1.5 Alloy/heat treated steel	>250, ≤350	>850, ≤1200		20-30		20-50	O
		1.6 Alloy/heat treated steel	>350	>1200					
	H	1.7 Hardened steel to 45 HRC	≤400	≤1400					
		1.8 Hardened steel to 58 HRC	≤600	≤2200					
2. Stainless steel	M	2.1 Stainless steel, sulphuretted	≤250	≤850		20-40		20-50	O
		2.2 Austentic	≤250	≤850		20-30		20-40	O
		2.3 Ferritic, ferritic & austentic, martensitic	≤300	≤1000		20-30		20-40	O
3. Cast iron	K	3.1 Grey cast iron	≤150	≤500					
		3.2 Grey cast iron , heat treated	>150, ≤300	>500, ≤1000					
		3.3 Vermicular cast iron	200-250	400-500					
		3.3 Spher. graph. cast iron	≤200	≤700		20-40		20-60	E/O
		3.4 Spher. graph. cast iron , heat treated	>200, ≤300	>700, ≤1000		20-30		20-40	E/O
		3.5 Malleable iron	≤200	≤700					
		3.6 Malleable iron , heat treated	>200, ≤300	>700, <1000					
4. Titanium	S	4.1 Pure titanium	≤200	≤700	10-15	20-30			O
		4.2 Titanium alloys	≤270	≤900	8-12	20-25			
		4.3 Titanium alloys	>270, ≤300	>900, ≤1250	5-10	10-15			
5. Nickel		5.1 Pure nickel	≤150	≤500	10-15	15-20		10-30	O
		5.2 Nickel alloys, heat resistant	<270	≤900	5-10	10-15		10-20	O
		5.3 Nickel alloys, high heat resistance	>270, ≤350	>900, ≤1200		5-10			O
6. Copper	N	6.1 Non-alloy copper	≤100	≤350	20-30	20-50	20-60	20-80	O/E
		6.2 short chip, brass, bronze, red brass	≤200	≤700					
		6.3 long chip brass	≤200	≤700	20-30	20-50	20-60	20-80	O/E
		6.4 Cu-Al-Fe alloy (Ampco)	≤470	≤500					
7. Aluminium/ Magnesium		7.1 Alu, Mg non-alloy	≤100	≤350		20-50	20-60	20-80	O/E
		7.2 Alu wrought alloy, breaking strain (A 5) <14 %	≤180	≤600		20-50	20-60	20-80	O/E
		7.3 Alu wrought alloy, breaking strain (A 5) ≥14 %	≤180	≤600		20-50	20-60	20-80	O/E
		7.4 Alu cast alloy, Si <10 %	<180	≤600		20-50	20-60	20-80	O/E
		7.5 Alu cast alloy, Si ≥10 %	≤180	≤600		20-50	20-60	20-80	O/E
8. Plastics		8.1 Thermoplastics							
		8.2 Thermosetting plastics							
		8.3 Fibre reinforced plastics							

Note:
The application details given depend on the environmental and application conditions (e.g. machine, ambient temperature, lubricant/coolant used and machining result required): they are based on the correct application conditions, correct use and compliance with the spindle speed limits given for the tools.

Recommended cutting data – boring and PCD tools
DRILLCUT/DRILLMAX high performance drills

Guidelines				Tool	High performance drills DRILLCUT/DRILLMAX								Drill reamers DREAMMAX			
				Cutting material	PCD								Solid carbide			
				Surface	uncoated								TiN			
				Nominal Ø(mm)	5-6		6-8		8-10		10-12			6-8	8-10	10-12
				Cutting values	V_c	f_b	V_c	f_b	V_c	f_b	V_c	f_b	V_c	f_z	f_z	f_z
Material		Material groups	Hardness (HB)	Strength (N/mm²)												
1. Steel	P	1.1 Magnetic soft iron	≤120	≤400												
		1.2 Structural, case hardened steel	≤200	≤700												
		1.3 Carbon steel	≤250	≤850												
		1.4 Alloy steel	≤250	≤850												
		1.5 Alloy/heat treated steel	>250, ≤350	>850, ≤1200												
		1.6 Alloy/heat treated steel	>350	>1200												
	H	1.7 Hardened steel to 45 HRC	≤400	≤1400												
		1.8 Hardened steel to 58 HRC	≤600	≤2200												
2. Stainless steel	M	2.1 Stainless steel, sulphuretted	≤250	≤850												
		2.2 Austentic	≤250	≤850												
		2.3 Ferritic, ferritic & austentic, martensitic	≤300	≤1000												
3. Cast iron	K	3.1 Grey cast iron	≤150	≤500									30-60	0,03-0,10	0,04-0,10	0,07-0,10
		3.2 Grey cast iron , heat treated	>150, ≤300	>500, ≤1000									30-60	0,03-0,10	0,04-0,10	0,07-0,10
		3.3 Vermicular cast iron	200-250	400-500												
		3.4 Spher. graph. cast iron	≤200	≤700									30-60	0,03-0,10	0,04-0,10	0,07-0,10
		3.5 Spher. graph. cast iron, heat treated	>200, ≤300	>700, ≤1000												
		3.6 Malleable iron	≤200	≤700												
		3.7 Malleable iron, heat treated	>200, ≤300	>700, <1000												
4. Titanium	S	4.1 Pure titanium	≤200	≤700												
		4.2 Titanium alloys	≤270	≤900												
		4.3 Titanium alloys	>270, ≤300	>900, ≤1250												
5. Nickel		5.1 Pure nickel	≤150	≤500												
		5.2 Nickel alloys, heat resistant	<270	≤900												
		5.3 Nickel alloys, high heat resistance	>270, ≤350	>900, ≤1200												
6. Copper	N	6.1 Non-alloy copper	≤100	≤350												
		6.2 short chip, brass, bronze, red brass	≤200	≤700	100-400	0,10-0,12	100-400	0,10-0,20	100-600	0,15-0,25	100-800	0,20-0,30				
		6.3 long chip brass	≤200	≤700												
		6.4 Cu-Al-Fe alloy (Ampco)	≤470	≤500												
7. Aluminium/ Magnesium		7.1 Alu, Mg non-alloy	≤100	≤350	100-600	0,10-0,15	100-800	0,15-0,25	150-1000	0,20-0,30	150-1200	0,25-0,35				
		7.2 Alu wrought alloy, breaking strain (A 5) <14 %	≤180	≤600	100-600	0,10-0,15	100-800	0,15-0,25	150-1000	0,20-0,30	150-1200	0,25-0,35	50-100	0,05-0,12	0,06-0,15	0,07-0,15
		7.3 Alu wrought alloy, breaking strain (A 5) ≥14 %	≤180	≤600	100-600	0,10-0,15	100-800	0,15-0,25	150-1000	0,20-0,30	150-1200	0,25-0,35	50-100	0,05-0,12	0,06-0,15	0,07-0,15
		7.4 Alu cast alloy, Si <10 %	<180	≤600	100-600	0,10-0,15	100-800	0,15-0,25	150-1000	0,20-0,30	150-1200	0,25-0,35				
		7.5 Alu cast alloy, Si ≥10 %	≤180	≤600	100-600	0,10-0,15	100-800	0,15-0,25	150-1000	0,20-0,30	150-1200	0,25-0,35				
8. Plastics		8.1 Thermoplastics														
		8.2 Thermosetting plastics														
		8.3 Fibre reinforced plastics			150-400	0,10-0,20	150-600	0,15-0,30	250-800	0,20-0,40	250-1000	0,25-0,50				

v_c = Cutting speed in m/min
f_b = Drilling feed in mm/rev.

Please see note on page 152

Recommended cutting data – boring and PCD tools
drill slot milling tools, thread milling tools, drill reamers

JEL

Drill slot milling tools													End mill						Thread milling tools					
													HF						MGF			GWF		
PCD													Solid carbide						PCD			PCD		
uncoated													DLC						uncoated			uncoated		
6		8		10		12		16		20			6-8			10-12				8	10-12		16	20
V_c	f_z	V_c	f_z	V_c	f_z	V_c	f_z	V_c	f_z	V_c	f_z		V_c	f_b	f_z	V_c	f_b	f_z	V_c	f_z	f_z	V_c	f_z	f_z
200-600	0,04-0,08	200-800	0,04-0,10	300-800	0,04-0,12	300-1000	0,04-0,15	300-1000	0,06-0,20	300-1000	0,06-0,20								300-1000	0,04-0,08	0,05-0,10	300-1500	0,04-0,15	0,05-0,20
200-800	0,04-0,08	200-800	0,04-0,10	400-1000	0,04-0,12	400-1500	0,04-0,15	400-1500	0,06-0,20	400-1500	0,06-0,20		100-300	0,05-0,06	0,12-0,25	100-300	0,06-0,1	0,25-0,35	400-1500	0,04-0,08	0,04-0,10	400-2000	0,05-0,15	0,06-0,20
200-800	0,04-0,08	200-800	0,04-0,10	400-1000	0,04-0,12	400-1500	0,04-0,15	400-1500	0,06-0,20	400-1500	0,06-0,20		200-500	0,05-0,06	0,12-0,25	200-500	0,06-0,1	0,25-0,35	400-1500	0,04-0,08	0,04-0,10	400-2000	0,05-0,15	0,06-0,20
200-800	0,04-0,08	200-800	0,04-0,10	400-1000	0,04-0,12	400-1500	0,04-0,15	400-1500	0,06-0,20	400-1500	0,06-0,20		200-500	0,05-0,06	0,12-0,25	200-500	0,06-0,1	0,25-0,35	400-1500	0,04-0,08	0,04-0,10	400-2000	0,05-0,15	0,06-0,20
200-800	0,04-0,08	200-800	0,04-0,10	400-1000	0,04-0,12	400-1500	0,04-0,15	400-1500	0,06-0,20	400-1500	0,06-0,20		200-500	0,05-0,06	0,12-0,25	200-500	0,06-0,1	0,25-0,35	400-1500	0,04-0,08	0,04-0,10	400-2000	0,05-0,15	0,06-0,20
200-800	0,04-0,08	200-800	0,04-0,10	400-1000	0,04-0,12	400-1500	0,04-0,15	400-1500	0,06-0,20	400-1500	0,06-0,20		300-600	0,05-0,06	0,12-0,20	300-600	0,06-0,1	0,25-0,3	400-1500	0,04-0,08	0,04-0,10	400-2000	0,05-0,15	0,06-0,20
200-800	0,04-0,08	200-800	0,04-0,10	400-1000	0,04-0,12	400-1500	0,04-0,15	400-1500	0,06-0,20	400-1500	0,06-0,20		300-600	0,05-0,06	0,12-0,20	300-600	0,06-0,1	0,25-0,3	400-1500	0,04-0,08	0,04-0,10	400-2000	0,05-0,15	0,06-0,20
200-800	0,04-0,08	200-800	0,04-0,10	400-1000	0,04-0,12	400-1500	0,04-0,15	400-1500	0,06-0,20	400-1500	0,06-0,20		300-600	0,05-0,06	0,12-0,20	300-600	0,06-0,1	0,25-0,3	400-1500	0,04-0,08	0,04-0,10	400-2000	0,05-0,15	0,06-0,20
300-600	0,04-0,10	400-800	0,04-0,15	500-1200	0,04-0,20	500-1200	0,04-0,25	500-1200	0,04-0,25	500-1200	0,04-0,25								400-1500	0,04-0,10	0,05-0,20	500-2000	0,05-0,20	0,06-0,25

v_c = Cutting speed in m/min
f_b = Drilling feed in mm/rev.
f_z = Milling feed in mm/tooth

Please see note on page 152

Index of Order Numbers

Order No. 20120	Chapter.Page
20120001000008	97
20120001000011	97
20120001000013	97
20120001000014	97
20120001000015	97
20120001000017	97
20120001000018	97
20120001000020	97
20120001000022	97
20121001000024	97
20121001000025	97
20121001000026	97
20121002000029	102
20121002000048	102
20121002000070	102
20121002000094	102
20121002000111	102
20121002000113	102
20121002000131	102
20121002000147	102
20121002000160	102
20121002000174	102
20122001000005	97
20122001000008	97
20122001000011	97
20122001000013	97
20122001000015	97
20122001000017	97
20122001000018	97
20122001000019	97
20122001000020	97
20122001000022	97
20123001000024	97
20123001000025	97
20123001000026	97
20123001000027	97
20123001000028	97
20123001000029	97
20123001000030	97
20123002000029	101
20123002000048	101
20123002000070	101
20123002000094	101
20123002000111	101
20123002000113	101
20123002000147	101
20123002000160	101
20123002000174	101
20123002000188	101
20123002000202	101
20123002000216	101
20123002000230	101
20123002000244	101
20136001000005	97
20136001000008	97
20136001000011	97
20136001000013	97
20136001000015	97
20136001000017	97
20136001000018	97
20136001000020	97
20136001000022	97
20137001000024	97
20137001000025	97
20137001000026	97
20137001000027	97
20137001000028	97
20137002000070	101
20137002000094	101
20137002000113	101
20137002000131	101
20137002000147	101
20144001000008	98
20144001000011	98
20144001000013	98
20144001000014	98
20144001000015	98
20144001000017	98
20144001000018	98
20144001000020	98
20144001000022	98
20145001000024	98
20145001000025	98
20145001000026	98
20145001000027	98
20145001000028	98
20145002000029	103
20145002000048	103
20145002000070	103
20145002000094	103
20145002000111	103
20145002000113	103
20145002000131	103
20145002000147	103
20145002000160	103
20145002000174	103

Order No. 20146	Chapter.Page
20146001000008	99
20146001000011	99
20146001000013	99
20146001000014	99
20146001000015	99
20146001000017	99
20146001000018	99
20146001000020	99
20146001000022	99
20147001000024	99
20147001000025	99
20147001000026	99
20147001000027	99
20147001000028	99
20147001000029	99
20147001000030	99
20147002000029	104
20147002000048	104
20147002000070	104
20147002000094	104
20147002000111	104
20147002000113	104
20147002000131	104
20147002000147	104
20147002000160	104
20147002000174	104
20147002000188	104
20147002000202	104
20147002000216	104
20147002000230	104
20147002000244	104
20154001000008	100
20154001000011	100
20154001000013	100
20154001000015	100
20154001000017	100
20154001000018	100
20154001000020	100
20154001000022	100
20155001000024	100
20156001000015	97
20156001000017	97
20156001000018	97
20156001000020	97
20156001000022	97
20157001000024	97
20157001000025	97
20157001000026	97
20157001000027	97
20157001000028	97
20157002000070	102
20157002000094	102
20157002000113	102
20157002000131	102
20157002000147	102
20157002000174	102
20170001000008	99
20170001000011	99
20170001000013	99
20170001000014	99
20170001000015	99
20170001000017	99
20170001000018	99
20170001000020	99
20170001000022	99
20171001000024	99
20171001000025	99
20171001000026	99
20171001000027	99
20171001000028	99
20171002000070	104
20171002000094	104
20171002000113	104
20171002000131	104
20171002000147	104
20171002000160	104
20171002000174	104
20186001000013	97
20186001000015	97
20186001000017	97
20186001000018	97
20186001000020	97
20186001000022	97
20187001000024	97
20190001000008	98
20190001000011	98
20190001000013	98
20190001000015	98
20190001000017	98
20190001000018	98
20190001000020	98
20190001000022	98
20191001000024	98
20192001000008	98
20192001000011	98
20192001000013	98

Order No. 20192	Chapter.Page
20192001000015	98
20192001000017	98
20192001000018	98
20192001000020	98
20192001000022	98
20193001000024	98
20194001000008	97
20194001000011	97
20194001000013	97
20194001000015	97
20194001000017	97
20194001000018	97
20194001000020	97
20194001000022	97
20322001000013	97
20322001000015	97
20322001000017	97
20322001000018	97
20322001000020	97
20322001000022	97
20323001000024	97
20323002000070	101
20323002000094	101
20323002000113	101
20323002000131	101
20323002000147	101
20342001000013	99
20342001000015	99
20342001000017	99
20342001000018	99
20342001000020	99
20342001000022	99
20343001000024	99
20346001000013	99
20346001000015	99
20346001000017	99
20346001000018	99
20346001000020	99
20346001000022	99
20347001000024	99
20347001000025	99
20347001000026	99
20347001000027	99
20347001000028	99
20347002000070	104
20347002000094	104
20347002000113	104
20347002000131	104
20347002000147	104
20356001000013	97
20356001000015	97
20356001000017	97
20356001000018	97
20356001000020	97
20356001000022	97
20357001000024	97
20374001000008	116
20374001000011	116
20374001000013	116
20374001000015	116
20374001000017	116
20374001000018	116
20374001000020	116
20374001000022	116
20375001000024	116
20375001000025	116
20375002000094	117
20375002000113	117
20375002000131	117
20375002000147	117
20376001000013	116
20376001000015	116
20376001000017	116
20376001000018	116
20376001000020	116
20376001000022	116
20377001000024	116
20377001000025	116
20377002000094	117
20377002000113	117
20377002000131	117
20377002000147	117
20444001000018	105
20444001000020	105
20444001000022	105
20445001000024	105
20446001000018	106
20446001000020	106
20446001000022	106
20447001000024	106
20456001000018	107
20456001000020	107
20456001000022	107
20457001000024	107
20544001000018	105
20544001000020	105

Order No. 20544	Chapter.Page
20544001000022	105
20545001000024	105
20546001000018	106
20546001000020	106
20546001000022	106
20547001000024	106
20556001000018	107
20556001000020	107
20556001000022	107
20557001000024	107
20574001000018	116
20574001000020	116
20574001000022	116
20575001000024	116
20575001000025	116
20575001000026	116
20575002000094	117
20575002000113	117
20575002000131	117
20575002000147	117
20598001000018	116
20598001000020	116
20598001000022	116
20599001000024	116
20599002000094	117
20599002000113	117
20599002000131	117
20599002000147	117
20622001000013	97
20622001000015	97
20622001000017	97
20622001000018	97
20622001000020	97
20622001000022	97
20623001000024	97
20646001000013	99
20646001000015	99
20646001000017	99
20646001000018	99
20646001000020	99
20646001000022	99
20647001000024	99
20744001000018	105
20744001000020	105
20744001000022	105
20745001000024	105
30802005001150	91
30802007001150	91
30970001000020	90
30970001000022	90
30970001000024	90
30970002000094	90
30970002000113	90
38390000000600	88
38390000000800	88
38390000001000	88
38390000001200	88
38391000001600	88
38391000002000	88
38392057000600	88
38392063000800	88
38392072001000	88
38392083001200	88
38393004002000	88
38393090001600	88
38405002000600	87
38405002000800	87
38405002001000	87
38588003000850	86
38588003000930	86
38588003001000	86
38588018001020	86
38588018001120	86
38588018001200	86
38588082000500	86
38588082000550	86
38588082000600	86
38588091000680	86
38588091000740	86
38588091000800	86
38802005001150	91
38802007001150	91
38970001000020	90
38970001000022	90
38970001000024	90
38970002000094	90
38970002000113	90
50111002000111	80
50111002000112	80
50111002000113	80
50111010000009	80
50111025000002	80
50115002000111	80
50115002000112	80
50115002000113	80
50161002000111	80

Order No. 50161	Chapter.Page
50161002000113	80
50161002000115	80
50161010000012	80
50161010000017	80
50161025000003	80
50165002000111	80
50165002000113	80
50165002000115	80
50221002000111	81
50221002000113	81
50221002000115	81
50221010000021	81
50221025000004	81
50225002000111	81
50225002000113	81
50225002000115	81
50225002000117	81
50225010000021	81
50225025000004	81
50271002000113	81
50271002000115	81
50271010000021	81
50271025000004	81
50275002000113	81
50275002000115	81
50275010000021	81
50275025000004	81
50341001001020	82
50341001001525	82
50341001251100	82
50341001251400	82
50341002001020	82
50341002003040	82
50341004005060	82
50391045011600	83
50391045022000	83
50391045043400	83
50987000001111	80
50987000001516	80
50987000002022	80
50987000002527	80
5502104020	82
5502104020	83
5502104020	83
5502105025	83
5502105025	83
5502108035	82
5502108035	83
5502108035	83
58310016001050	82
58310016001080	82
58310020002060	82
58310020002060	83
58310020002060	83
58310020002096	82
58310020002096	83
58310020002096	83
58310025004136	82
78451003001000	92
78451018001200	92
78451082000600	92
78451091000800	92
78931057000600	89
78931063000800	89
78931072001000	89
78931083001200	89
80126001000015	111
80126001000017	111
80126001000018	111
80126001000020	111
80126001000022	111
80127001000024	111
80127001000025	111
80127001000026	111
80128001000015	111
80128001000017	111
80128001000018	111
80128001000020	111
80128001000022	111
80129001000024	111
80129001000025	111
80129001000026	111
80273001000015	24
80273001000017	24
80273001000018	24
80273001000020	24
80273001000022	24
80273001000024	24
80273001000025	24
80273001000026	24
80273001000028	24
80273002000070	25
80273002000094	25
80273002000113	25
80273002000131	25
80273002000147	25

Index of Order Numbers

Index of Order Numbers

Index of Order Numbers

Notes

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