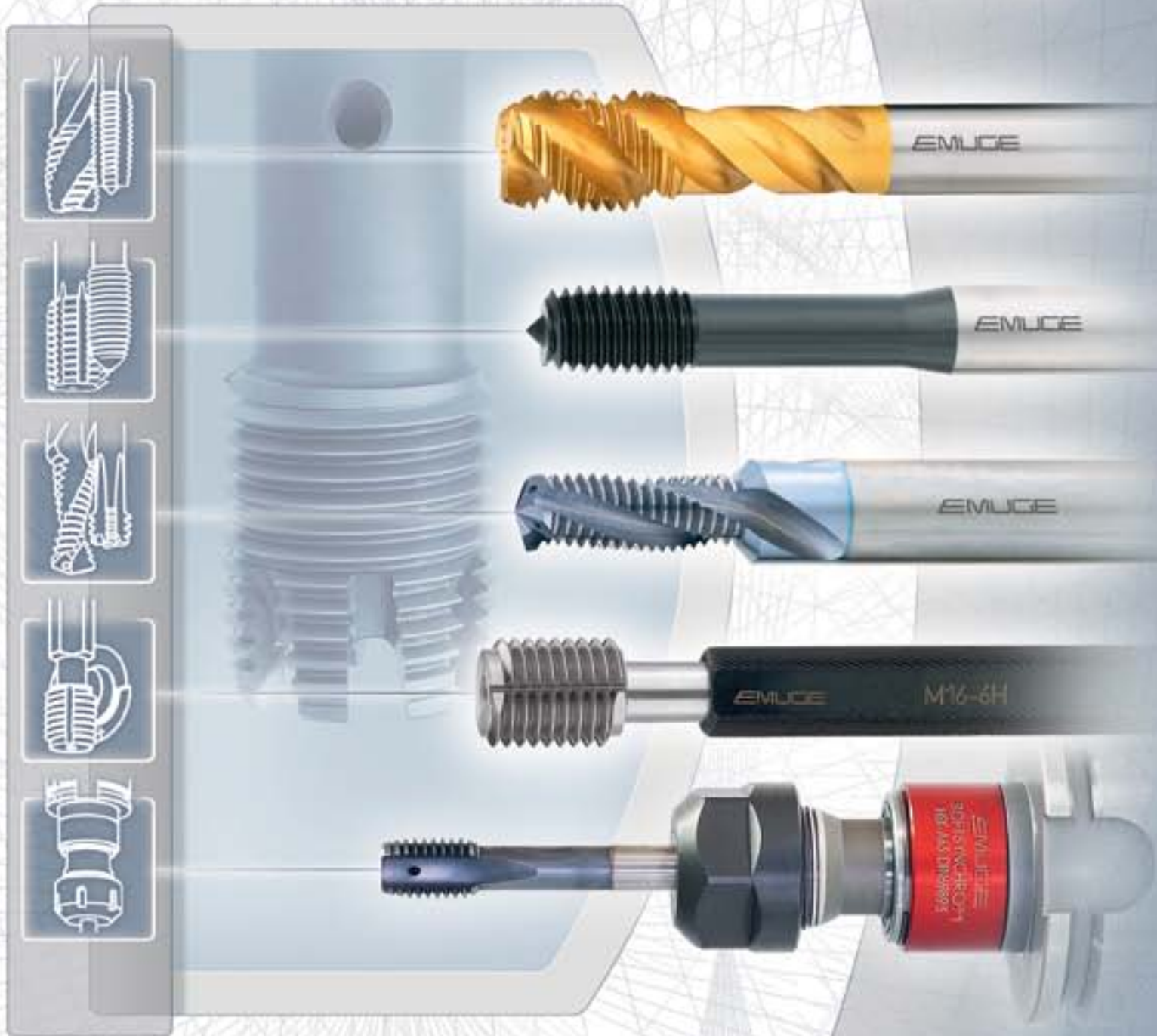


# EMUGE

Threading Technology  
Clamping Technology



High Performance Tools

510

# EMUGE HIGH PERFORMANCE TOOLS

## Emuge Corp. Technology Center

West Boylston, MA, U.S.A.

**Emuge Corp.** is a wholly owned subsidiary of EMUGE-Werk Richard Glimpel GmbH & Co. KG (Lauf, Germany) that has been the product technology and performance leader in their field for nearly 100 years. Emuge manufactures an extensive line of taps, thread mills, end mills, toolholders, clamping devices and other rotary cutting tools, over 100,000 items sold through distributors worldwide. Emuge also offers end-user technical support through a network of in-the-field engineers and in-house product specialists, all with extensive tooling and application experience.



Over 10,000 types of cutting tools and accessories are stocked in Emuge's U.S. and Canadian Headquarters located in West Boylston, MA, U.S.A. The 21,000 square foot state-of-the-art facility also serves as a technology center with a machining and tooling demonstration showroom and classroom.

# EMUGE

Thread Cutting Technology · Clamping Technology

## CATALOG 510

Welcome to our **EMUGE Catalog 510**. Let our new catalog be your guide on a trip to the very leading edge of thread cutting technology and into the twenty-first century!

At **EMUGE** we are dedicated to exhaustive research and development, product manufacturing excellence, and unsurpassed customer service. We have introduced more new and innovative products recently than ever before in our history. These, in combination with our standard lines, comprise the most comprehensive and technologically advanced thread and cutting tool product line in the world.

**EMUGE Tools are designed and engineered for use today... and in future. Whether your application requirements are general purpose or high tech, we can find the right thread cutting solution for you.**

We can recommend the appropriate tool, monitor initial product tests, provide installation assistance, and offer product support services through-out our relationship with you. That promises to be a very long time because our customer relationship tend to be a long term. We're proud of that.

*We have a slogan —*  
***EMUGE Finds Success In Yours.***  
*Let's work together for that success.*

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### **EMUGE Corp.**

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### Taps



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### Roll Form Taps



3

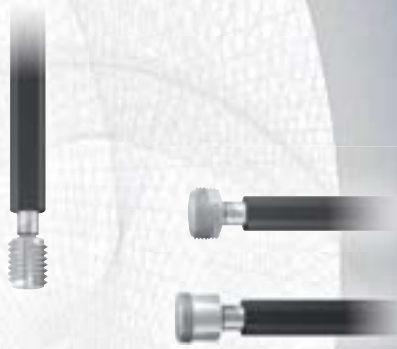
183 - 283

### Thread Mills



Page

# Thread Gages



284 - 294

4



# Tap Holders and Tapping Attachments

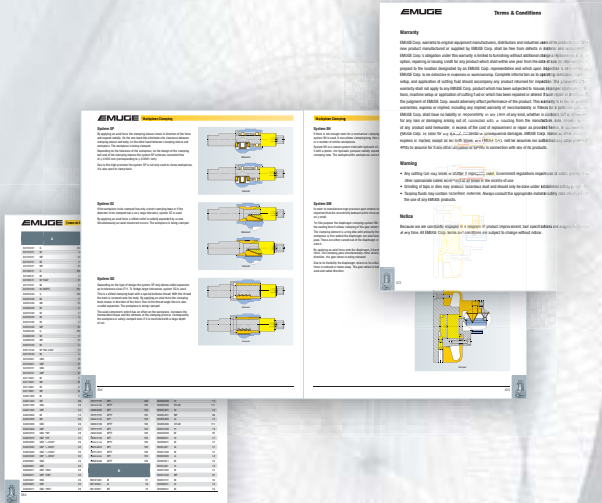


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# General Information



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6







American units into SI units			SI units into American units		
<b>Length</b>					
1 inch (in)	= 25.4 mm	= 2.54 cm	1 millimeter (mm)	= 0.03937 in	
1 foot (ft)	= 12 in	= 0.3048 m	1 centimeter (cm)	= 10 mm	= 0.3937 in
1 yard (yd)	= 3 ft	= 0.9144 m	1 meter (m)	= 100 cm = 3.2808 ft = 1.0936 yd	
1 statute mile	= 1760 yd	= 1.60934 km	1 kilometer (km)	= 1000 m	= 0.62137 statute mile
<b>Area</b>					
1 in <sup>2</sup>	= 645.16 mm <sup>2</sup>	= 6.4516 cm <sup>2</sup>	1 mm <sup>2</sup>	= 0.00155 in <sup>2</sup>	
1 ft <sup>2</sup>	= 144 in <sup>2</sup>	= 0.0929 m <sup>2</sup>	1 cm <sup>2</sup>	= 100 mm <sup>2</sup>	= 0.155 in <sup>2</sup>
1 yd <sup>2</sup>	= 9 ft <sup>2</sup>	= 0.8361 m <sup>2</sup>	1 m <sup>2</sup>	= 10000 cm <sup>2</sup> = 10.7642 ft <sup>2</sup> = 1.196 yd <sup>2</sup>	
1 mile <sup>2</sup>		= 2.590 km <sup>2</sup>	1 km <sup>2</sup>	= 10 <sup>6</sup> m <sup>2</sup>	= 0.3861 mile <sup>2</sup>
<b>Volume</b>					
1 in <sup>3</sup>	= 16387.064 mm <sup>3</sup>	= 16.387 cm <sup>3</sup>	1 mm <sup>3</sup>	= 0.000061 in <sup>3</sup>	
1 ft <sup>3</sup>	= 1728 in <sup>3</sup>	= 0.0283 m <sup>3</sup>	1 cm <sup>3</sup>	= 1000 mm <sup>3</sup>	= 0.0610 in <sup>3</sup>
1 yd <sup>3</sup>	= 27 ft <sup>3</sup>	= 0.765 m <sup>3</sup>	1 m <sup>3</sup>	= 10 <sup>6</sup> cm <sup>3</sup> = 35.3146 ft <sup>3</sup> = 1.3080 yd <sup>3</sup>	
1 Quart / US	= 1/4 gal	= 0.946 l	1 Liter (l)	= 1 dm <sup>3</sup> = 0.2642 gal / US = 2.11 US pt	
1 gallon (gal) / US	= 4 quarts	= 3.784 l	1 l	= 1.761 UK pt	
1 gallon (gal) / UK		= 4.546 l			
1 US pint (pt)	= 0.8327 UK pt	= 0.473 l			
1 UK pt	= 1.201 US pt	= 0.568 l			
1 barrel / US (Oil)	= 42 gal	= 158.98 l			
1 barrel / UK	= 36 gal	= 163.66 l			
<b>Weight</b>					
1 ounce (oz)	= 16 drams	= 28.35 g	1 gram (g)	= 0.03527 oz	
1 pound (lb)	= 16 oz	= 453.592 g	1 kilogram (kg)	= 1000 g	= 2.20462 lb
1 short ton / US		= 0.907 t	1 ton (t)	= 1000 kg	= 1.1025 short tons / US
1 long ton / UK		= 1.016 t	1 ton (t)	= 1000 kg	= 0.984 long tons / UK
<b>Force</b>					
1 pound force (lbf)	= 4.448 N		1 Newton (N)	= 0.2248 lbf	
<b>Pressure/Tensile strength</b>					
1 lbf/ft <sup>2</sup>	= 47.8803 Pa		1 Pascal (Pa)	= 10 <sup>6</sup> N/mm <sup>2</sup>	= 0.02089 lbf/ft <sup>2</sup>
1 lbf/in <sup>2</sup>	= 6.89476 kPa	= 6.895 · 10 <sup>-3</sup> N/mm <sup>2</sup>	1 N/mm <sup>2</sup>	= 0.1 bar	= 145 psi
1 psi (pound-force per sq.in)	= lbwt/in <sup>2</sup>	= 6.895 · 10 <sup>-3</sup> N/mm <sup>2</sup>	1 bar	= 10 N/mm <sup>2</sup>	= 14.5 psi
1 psi		= 6.895 · 10 <sup>-2</sup> bar			
<b>Power</b>					
1 foot-pounds per second (ft lb/s)	= 1.356 W		1 Watt (W)	= 1 J/s = 1 Nm/s	= 0.7376 ft lb/s
<b>Energy/Torque</b>					
1 foot pound-force (ft-lbf)	= 1.356 J		1 Joule (J)	= 1 Nm	= 0.7376 ft lb
<b>Cutting/Circumferential speed</b>					
1 surface feet per minute (SFM)	= 0.3048 m/min		1 m/min		= 3.2808 SFM
<b>Cutting/Circumferential speed</b>					
in degree Fahrenheit (°F)	= 9/5 Temp.[°C]+32		in degree Celsius (°C)	= (Temp.[°F]-32) · 5/9	



## Taps

	Page
Contents	6 - 7
Product finder and cutting data	8 - 17
Product pages	18 - 120
Technical information	121 - 141

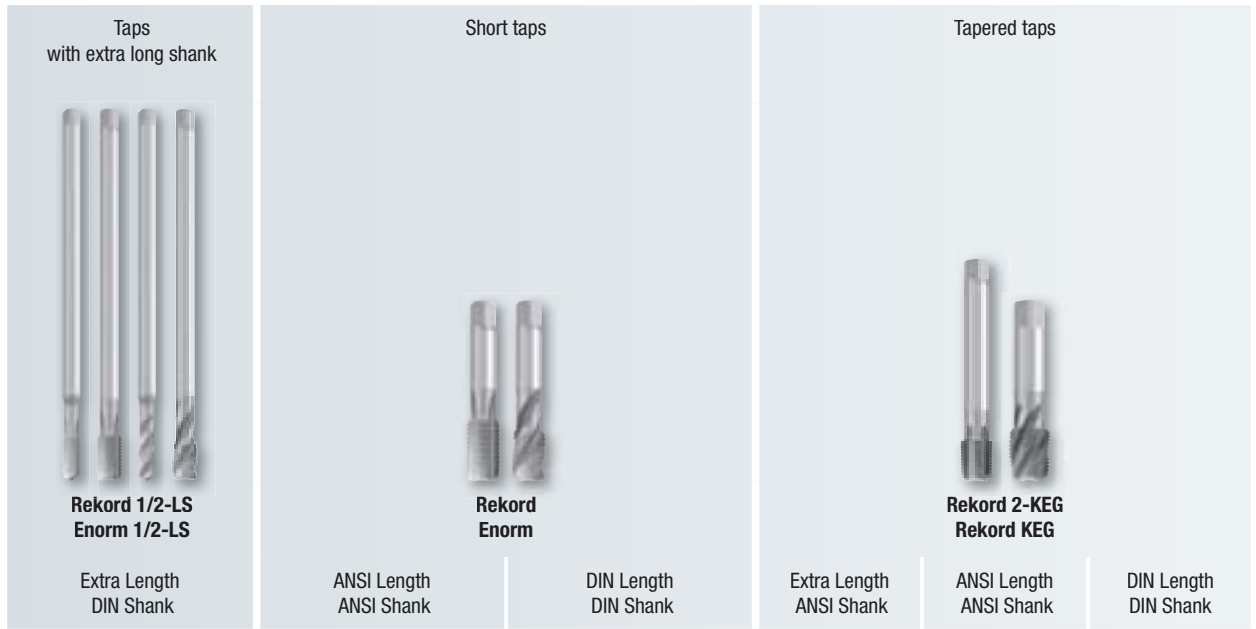
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- R<sub>p</sub> (BSPP)
- G
- NPT
- NPTF
- R<sub>c</sub> (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

Taps with reinforced shank		Taps with reduced shank		Taps with internal chip collector		Taps with long flutes
						
<b>Rekord 1 Enorm 1</b>		<b>Rekord 2 Enorm 2</b>		<b>Robust 2X</b>		<b>Rekord 2-LF</b>
DIN Length ANSI Shank	DIN Length DIN Shank	DIN Length ANSI Shank	DIN Length DIN Shank	DIN Length ANSI Shank	DIN Length DIN Shank	Extra Length DIN Shank

	Page					
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<b>UNF</b>	31 - 39		31 - 39		40	
<b>UNEF</b>				44		
<b>UN-8</b>			45 - 46		47	
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<b>MF</b>		75 - 85		75 - 85	86 - 87	88
<b>NPSM/NPSC</b>				92		
<b>NPSF</b>				93		
<b>R<sub>p</sub> (BSPP)</b>				94		
<b>G</b>		95		96 - 98	99	
<b>NPT</b>						
<b>NPTF</b>						
<b>R<sub>c</sub> (BSPT)</b>						
<b>STI-UNC</b>	109		109			
<b>STI-UNF</b>	110		110			
<b>STI-M</b>		111 - 112		111 - 112		
<b>LK-UNC</b>	113		113			
<b>LK-M</b>		114		114		

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<b>Taper Reamers 1:16</b>	108
<b>Tapping Fluid</b>	115
<b>Special Shank Extensions</b>	116 - 120





Page						
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	41 - 43					<b>UNF</b>
						<b>UNEF</b>
						<b>UN-8</b>
68 - 69	70 - 71	72 - 74				<b>M</b>
	89 - 90	91				<b>MF</b>
						<b>NPSM/NPSC</b>
						<b>NPSF</b>
						<b>Rp (BSPP)</b>
		100				<b>G</b>
			101	102 - 103		<b>NPT</b>
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					107	<b>Rc (BSPT)</b>
						<b>STI-UNC</b>
						<b>STI-UNF</b>
						<b>STI-M</b>
						<b>LK-UNC</b>
						<b>LK-M</b>


## Fold-Out Page


This fold-out page is intended to be a guide to the diverse application ranges, organized according to material groups.

Product finder and cutting data









**Please note:**  
The cutting speeds ( $v_c$  in SFM) listed in the respective columns are standard values which have to be adjusted to individual work conditions (material, lubrication, machine etc.).

The suitability is marked as follows:  
- Preferred suitable tap  
- Suitable tap

 = Suitable coolant-lubricant  
E = Emulsion  
O = Thread cutting oil  
P = Thread cutting paste  
M = Minimum quantity lubrication (MQL)  
A = Dry / Pressurized air

 = DIN form / threads (chamfer length)

Standard Taps

	Rekord A-STEEL	Rekord A-STEEL-AZ	Rekord A-GJV TIGN	Rekord A-GJV/E TIGN	Rekord A-GJV IKZ-TIGN	Rekord A-GJV/E IKZ-TIGN	Rekord A-GAL/E IKZ-TIGN	Rekord A-GAL/E IKZN-TIGN	Rekord A-MS	Rekord A-MG GLT-1	Rekord A-FK	Rekord A-H
	C / 2-3	C / 2-3	C / 2-3	E / 1.5-2	C / 2-3	E / 1.5-2	E / 1.5-2	E / 1.5-2	C / 2-3	C / 2-3	C / 2-3	C / 2-3
	E / 0	E / 0	E / 0	E / 0	E / 0	E / 0	E / 0	E / 0	E / 0	E / 0 / A	E / 0	E / 0 / P
Thread Depth and Hole Type	max. 2 x d <sub>1</sub> 		max. 2 x d <sub>1</sub> 		max. 2 x d <sub>1</sub> 		max. 2 x d <sub>1</sub> 		max. 2 x d <sub>1</sub> 		max. 2 x d <sub>1</sub> 	
UNC												18, 28
UNF												31, 41
UNEF, UN-8	44 (UNEF)	48, 72	48	48	48	49	49	49	49, 72	49	49	45 (UN-8)
M												49, 68
MF												75
NPSM/NPSC												
NPSF												
Rp (BSPP)												
G									100			96
NPT												
NPTF												
Rc (BSPT)												
STI												
SELF-LOCK												

	Application – Material	Hardness Range			Material Examples
		HRC	BHN	N/mm <sup>2</sup>	
<b>Steel materials</b>					
P	1.1 Cold-extrusion steels, Construction steels, Free-cutting steels, etc.		≤ 180	≤ 600	1010 / 1018 / 1020 / 12L14 / 12L15 / A36 / T1
	2.1 Construction steels, Cementation steels, Steel castings, etc.	≤ 22	≤ 235	≤ 800	A36 / T1 / 1030-1095 / 4140 / 4340 / 8620
	3.1 Cementation steels, Heat-treatable steels, Cold work steels, etc.	≤ 31	≤ 295	≤ 1000	4140 / 4340 / 8620 / P20 / H13 / D2 / A2 / S7 / H1150
	4.1 Heat-treatable steels, Cold work steels, Nitriding steels, etc.	≤ 38	≤ 355	≤ 1200	4140 / 4340 / 8620 / P20 / H13 / D2 / 300M / 52100 / M1-M42
	5.1 High-alloyed steels, Cold work steels, Hot work steels, etc.	≤ 44	≤ 415	≤ 1400	4140 / 4340 / 8620 / P20 / H13 / D2 / 300M / 52100
<b>Stainless steel materials</b>					
M	1.1 Ferritic, martensitic	≤ 29	≤ 280	≤ 950	410 / 440 / 440C / 17-4 PH
	2.1 Austenitic	≤ 29	≤ 280	≤ 950	303 / 304 / 316 / 316L / 321
	3.1 Austenitic-ferritic (Duplex)	≤ 35	≤ 325	≤ 1100	
	4.1 Austenitic-ferritic heat-resistant (Super Duplex)	≤ 39	≤ 370	≤ 1250	
<b>Cast materials</b>					
K	1.1 Cast iron with lamellar graphite (GJL)		30 - 75	100 - 250	Grey cast irons G10-GG40
	1.2		75 - 135	250 - 450	
	2.1 Cast iron with nodular graphite (GJS)		105 - 150	350 - 500	Nodular GGG40-GGG70
	2.2		150 - 265	500 - 900	
	3.1 Cast iron with vermicular graphite (GJV)		90 - 120	300 - 400	
	3.2		120 - 150	400 - 500	Compact graphite iron (CGI)
	4.1 Malleable cast iron (GTMW, GTMB)		70 - 145	250 - 500	
	4.2		150 - 235	500 - 800	White iron
<b>Non ferrous materials</b>					
<b>Aluminium alloys</b>					
N	1.1 Aluminium wrought alloys		≤ 60	≤ 200	7075
	1.2		≤ 105	≤ 350	6061-T6 / 2024-T4
	1.3		≤ 165	≤ 550	
	1.4 Aluminium cast alloys Si ≤ 7%				
	1.5 Aluminium cast alloys 7% < Si ≤ 12%				
	1.6 Aluminium cast alloys 12% < Si ≤ 17%				
<b>Copper alloys</b>					
N	2.1 Pure copper, low-alloyed copper		≤ 120	≤ 400	
	2.2 Copper-zinc alloys (brass, long-chipping)		≤ 165	≤ 550	
	2.3 Copper-zinc alloys (brass, short-chipping)		≤ 165	≤ 550	
	2.4 Copper-aluminium alloys (alu bronze, long-chipping)		≤ 235	≤ 800	
	2.5 Copper-tin alloys (tin bronze, long-chipping)		≤ 205	≤ 700	
	2.6 Copper-tin alloys (tin bronze, short-chipping)		≤ 120	≤ 400	
	2.7 Special copper alloys		≤ 180	≤ 600	
	2.8	≤ 44	≤ 415	≤ 1400	
<b>Magnesium alloys</b>					
N	3.1 Magnesium wrought alloys		≤ 150	≤ 500	
	3.2 Magnesium cast alloys		≤ 150	≤ 500	
<b>Synthetics</b>					
N	4.1 Duroplastics (short-chipping)				
	4.2 Thermoplastics (long-chipping)				
	4.3 Fibre-reinforced synthetics (fibre content ≤ 30%)				
	4.4 Fibre-reinforced synthetics (fibre content > 30%)				
<b>Special materials</b>					
N	5.1 Graphite				
	5.2 Tungsten-copper alloys				
	5.3 Composite materials				
<b>Special materials</b>					
<b>Titanium alloys</b>					
S	1.1 Pure titanium		≤ 135	≤ 450	CP1 / CP2
	1.2 Titanium alloys	≤ 27	≤ 265	≤ 900	6AL4V
	1.3	≤ 39	≤ 370	≤ 1250	
<b>Nickel alloys, cobalt alloys and iron alloys</b>					
S	2.1 Pure nickel		≤ 180	≤ 600	
	2.2 Nickel-base alloys	≤ 31	≤ 295	≤ 1000	Monel 500
	2.3	≤ 49	≤ 475	≤ 1600	718 Inconel
	2.4 Cobalt-base alloys	≤ 31	≤ 295	≤ 1000	
	2.5	≤ 49	≤ 475	≤ 1600	Haynes 25
	2.6 Iron-base alloys	≤ 46	≤ 445	≤ 1500	Incoloy 925
<b>Hard materials</b>					
H	1.1		44 - 50		
	1.2		50 - 55		
	1.3		55 - 60		
	1.4		60 - 63		
	1.5		63 - 66		

1) Threading in through holes is possible only with external cooling/lubrication

														Product Finder	
														$v_c$	
Rekord A-H/E	Rekord A-H-IKZ	Rekord A-H/E TIN	Rekord A-H TICN	Rekord A-H-IKZ TICN	Rekord A-H-IKZN TICN	Rekord A-HCUT TICN	Rekord A-Z TICN	Rekord A-Z-IKZ TICN	Rekord A-Z-IKZN TICN	Rekord A-Z-IKZ LF4-GLT-1	Rekord B-STEEL	Rekord B-STEEL-AZ	Rekord B-STEEL CRN	Thread Depth and Hole Type	UNC
E / 1.5-2	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	B / 4-5	B / 4-5	B / 4-5	UNC
E / O / P	E / O	E / O / P	E / O / P	E / O	E / O	O / P	E / O / P	E / O	E / O	E / O	E / O	E / O	E / O	E / O	UNF
max. 2 x $d_1$	max. 2 x $d_1$	max. 2 x $d_1$		max. 2 x $d_1$	max. 2 x $d_1$	max. 1.5 x $d_1$	max. 2 x $d_1$	max. 2 x $d_1$	max. 2 x $d_1$	max. 2 x $d_1$	max. 4 x $d_1$	max. 3 x $d_1$			UNF
															UNF
			28 41				18 31	18 31	18 31	18 31		19 32, 33 44 (UNEF) 54, 68, 73 79, 91	19 33		UNF
70 89	49 75	70 89	50 76	50 76	50 76	50 76	51 76	51 76	51 77	51 77	67 88	54, 73			UNEF, UN-8
			96			95, 96						97, 100			M
															MF
															NPSM/NPSC
															NPSF
															G
															NPT
															NPTF
															Rc (BSPT)
															STI
															SELF-LOCK
															Accessories
															Tech. Info
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<b>16 - 66</b>	<b>16 - 66</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>		<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	16 - 66	16 - 66	<b>33 - 131</b>	2.1
<b>7 - 49</b>	<b>7 - 49</b>	<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>		<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>			<b>16 - 82</b>	3.1
		16 - 66	16 - 66	16 - 66	16 - 66		<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>			16 - 66	4.1
															5.1
															1.1
															2.1
															3.1
															4.1
<b>33 - 82</b>	<b>33 - 82</b>	<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>		<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>				1.1
<b>33 - 66</b>	<b>33 - 66</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>		<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>				1.2
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<b>16 - 49</b>	<b>16 - 49</b>	<b>33 - 82</b>	<b>33 - 82</b>	<b>33 - 82</b>	<b>33 - 82</b>		<b>33 - 82</b>	<b>33 - 82</b>	<b>33 - 82</b>	<b>33 - 82</b>	<b>33 - 82</b>				2.2
16 - 49	16 - 49	33 - 82	33 - 82	33 - 82	33 - 82		33 - 82	33 - 82	33 - 82	33 - 82	33 - 82				3.1
16 - 33	16 - 33	33 - 66	33 - 66	33 - 66	33 - 66		33 - 66	33 - 66	33 - 66	33 - 66	33 - 66				3.2
<b>33 - 82</b>	<b>33 - 82</b>	<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>		<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>				4.1
<b>33 - 66</b>	<b>33 - 66</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>		<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>				4.2
															1.1
															1.2
															1.3
							49 - 131	49 - 131	49 - 131	49 - 131	49 - 131			49 - 131	1.4
							49 - 131	49 - 131	49 - 131	49 - 131	49 - 131			49 - 131	1.5
							33 - 98	33 - 98	33 - 98	33 - 98	33 - 98				1.6
															2.1
												<b>33 - 131</b>	<b>33 - 131</b>	<b>66 - 197</b>	2.2
															2.3
7 - 33	7 - 33	16 - 82	16 - 82	16 - 82	16 - 82		16 - 82	16 - 82	16 - 82	16 - 82	16 - 82			<b>16 - 82</b>	2.4
7 - 33	7 - 33	16 - 82	16 - 82	16 - 82	16 - 82		16 - 82	16 - 82	16 - 82	16 - 82	16 - 82			<b>16 - 82</b>	2.5
16 - 66	16 - 66	33 - 98	33 - 98	33 - 98	33 - 98		<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>				2.6
3 - 16	3 - 16	<b>7 - 33</b>	<b>7 - 33</b>	<b>7 - 33</b>	<b>7 - 33</b>		<b>7 - 33</b>	<b>7 - 33</b>	<b>7 - 33</b>	<b>7 - 33</b>	<b>7 - 33</b>				2.7
															2.8
															3.1
															3.2
16 - 82	16 - 82	33 - 131	33 - 131	33 - 131	33 - 131		33 - 131	33 - 131	33 - 131	33 - 131	33 - 131				4.1
															4.2
															4.3
															4.4
33 - 66	33 - 66														5.1
															5.2
															5.3
															1.1
															1.2
															1.3
															2.1
															2.2
															2.3
															2.4
															2.5
															2.6
															1.1
							<b>3 - 16</b>								1.2
							<b>3 - 10</b>								1.3
															1.4
															1.5

Product Finder

$v_c$

UNC

UNF

UNEF

UN-8

UNC

UNF

UNEF, UN-8

M

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info



Product Finder

Vc

UNC

UNF

UNEF

UN-8

M

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

NPT

NPTF

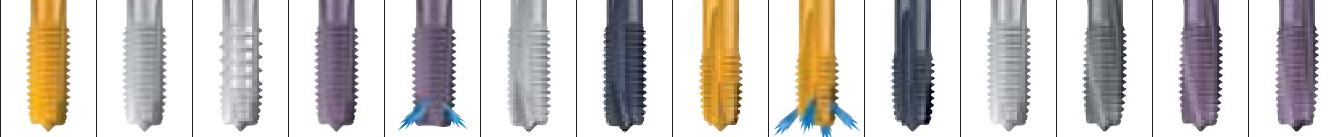
Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info



	Rekord B-STEEL TIN	Rekord B-VA	Rekord B-VA-AZ	Rekord B-VA TICN	Rekord B-VA-1KZn TICN	Rekord B-AL	Rekord B-AL GLT-8	Rekord B-Z TIN	Rekord B-Z-1KZn TICN	Rekord B-Z GLT-1	Rekord B-AERO	Rekord C-TI	Rekord C-TI TICN	Rekord C-NI TICN
	B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / approx. 3	B / approx. 3	B / 4-5	B / 4-5	B / 4-5	B / approx. 3	D / 4-5	D / 4-5	D / 4-5
	E / O	E / O / P	E / O / P	E / O / P	E / O	E / O	E / O	E / O / P	E / O	E / O / P	O / P	E / O / P	E / O / P	O / P

Thread Depth and Hole Type

max. 3 x d<sub>1</sub>



UNC	19, 20, 28	20, 28, 29			20			20	21	21	21	21, 29	22	22	
UNF	33, 41	33, 41, 42			33			33	34	34	34	35, 42	35	35	
UNEF, UN-8		45 (UN-8)		45 (UN-8)											
M	55, 70	55, 68, 70, 73	55, 73			55	55	55	56	56		57	57	57	
MF	79, 89	79, 80, 89						80	80	80					
NPSM/NPSC															
NPSF															
Rp (BSPP)															
G	97	97													
NPT															
NPTF															
Rc (BSPT)															
STI		109, 110, 111				111	111								
SELF-LOCK		114													
P	1.1	<b>49 - 148</b>	16 - 82	16 - 82	<b>49 - 148</b>	<b>49 - 148</b>		<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>					
	2.1	<b>33 - 131</b>	16 - 66	16 - 66	<b>33 - 131</b>	<b>33 - 131</b>		<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>					
	3.1	<b>16 - 82</b>	7 - 49	7 - 49	<b>16 - 82</b>	<b>16 - 82</b>		<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>					
	4.1	16 - 66			16 - 66	16 - 66		<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>		7 - 33	16 - 66		
	5.1							7 - 33	7 - 33	7 - 33		<b>3 - 16</b>	<b>7 - 33</b>		
M	1.1	<b>16 - 66</b>	7 - 33	7 - 33	<b>16 - 66</b>	<b>16 - 66</b>		<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>					
	2.1	<b>16 - 66</b>	7 - 33	7 - 33	<b>16 - 66</b>	<b>16 - 66</b>		<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>					
	3.1	16 - 49			16 - 49	16 - 49		<b>16 - 49</b>	<b>16 - 49</b>	<b>16 - 49</b>					
	4.1										7 - 33	<b>3 - 26</b>	<b>16 - 49</b>	7 - 33	
K	1.1														
	1.2														
	2.1	<b>33 - 98</b>	16 - 66	16 - 66	<b>33 - 98</b>	<b>33 - 98</b>		<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>					
	2.2	33 - 82			33 - 82	33 - 82						16 - 49	33 - 82		
	3.1														
	3.2														
	4.1														
	4.2														
N	1.1						<b>33 - 66</b>	<b>49 - 131</b>							
	1.2						<b>33 - 66</b>	<b>49 - 131</b>							
	1.3						<b>33 - 66</b>	<b>49 - 131</b>							
	1.4	49 - 131			49 - 131	49 - 131	33 - 66	49 - 131	<b>49 - 131</b>	<b>49 - 131</b>	<b>49 - 131</b>				
	1.5	49 - 131	33 - 66	33 - 66	49 - 131	49 - 131			49 - 131	49 - 131	49 - 131				
	1.6								33 - 98	33 - 98	33 - 98				
	2.1								<b>16 - 98</b>	<b>16 - 98</b>	<b>16 - 98</b>				
	2.2	<b>66 - 197</b>			<b>66 - 197</b>	<b>66 - 197</b>			<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>				
	2.3														
	2.4	<b>16 - 82</b>	7 - 33	7 - 33	<b>16 - 82</b>	<b>16 - 82</b>						7 - 33	<b>16 - 82</b>		
	2.5	<b>16 - 82</b>	7 - 33	7 - 33	<b>16 - 82</b>	<b>16 - 82</b>						7 - 33	<b>16 - 82</b>		
	2.6														
	2.7														
	2.8											3 - 16	<b>3 - 16</b>	<b>7 - 33</b>	3 - 16
	3.1														
	3.2														
4.1															
4.2															
4.3															
4.4															
5.1															
5.2															
5.3															
S	1.1							<b>16 - 49</b>	<b>16 - 49</b>	<b>16 - 49</b>		7 - 33	16 - 49		
	1.2											<b>3 - 26</b>	<b>7 - 33</b>		
	1.3											3 - 16	3 - 26		
	2.1														
	2.2											3 - 26	7 - 33		
	2.3											3 - 26	7 - 33		
2.4											<b>3 - 26</b>		<b>3 - 26</b>		
2.5											3 - 26	7 - 33			
2.6											<b>3 - 26</b>		<b>3 - 26</b>		
H	1.1														
	1.2														
	1.3														
	1.4														
	1.5														



Rekord D-STEEL	Rekord D-STEEL TIN	Rekord D-STEEL/E TIN	Rekord DF-STEEL TIN	Rekord DF-STEEL IKZ-TIN	Rekord D-VA	Rekord D-VA/E	Rekord D-VA-IKZ	Rekord DF-VA	Rekord D-VA-IKZ TiCN	Rekord D-GAL/E IKZ-TiCN	Rekord D-PVC/E CRN	Rekord DF-PVC/E CRN	Rekord D-TI	
C/2-3	C/2-3	E/1.5-2	C/2-3	C/2-3	C/2-3	E/1.5-2	C/2-3	C/2-3	C/2-3	E/1.5-2	E/1.5-2	E/1.5-2	C/2-3	
E/0	E/0	E/0	E/0	E/0	E/0/P	E/0/P	E/0	E/0/P	E/0	E/0	E	E	E/0/P	
max. 2 x d <sub>1</sub>											max. 2 x d <sub>1</sub>	max. 2 x d <sub>1</sub>	Thread Depth and Hole Type	
	22 35				22 35	44 (UNEF) 58, 68, 71, 73 81, 90, 91	58	58	58	59	59	59	23, 29 36, 42 45 (UN-8) 59	UNC UNF UNEF, UN-8 M MF NPSM/NPSC NPSF Rp (BSPP) G NPT NPTF Rc (BSPT) STI SELF-LOCK
57, 73 81, 91		57, 70 89	57 81	57 81										
97			97			97, 100								
													109, 110	
16 - 82	<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>	<b>49 - 148</b>	16 - 82	16 - 82	16 - 82	16 - 82	<b>49 - 148</b>					1.1
16 - 66	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>	<b>33 - 131</b>					2.1
	<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>	7 - 49	7 - 49	7 - 49	7 - 49	<b>16 - 82</b>					3.1
	16 - 66	16 - 66	16 - 66	16 - 66					16 - 66				7 - 33	4.1
													<b>3 - 16</b>	5.1
	16 - 66	16 - 66	16 - 66	16 - 66	7 - 33	7 - 33	7 - 33	7 - 33	16 - 66					1.1
	16 - 66	16 - 66	16 - 66	16 - 66	7 - 33	7 - 33	7 - 33	7 - 33	16 - 66					2.1
	16 - 49	16 - 49	16 - 49	16 - 49					16 - 49					3.1
														4.1
	49 - 148	49 - 148	49 - 148	49 - 148				33 - 82	49 - 148					1.1
	33 - 131	33 - 131	33 - 131	33 - 131				33 - 66	33 - 131					1.2
	<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>	16 - 66	16 - 66	16 - 66	16 - 66	<b>33 - 98</b>					2.1
	33 - 82	33 - 82	33 - 82	33 - 82				16 - 49	33 - 82			16 - 49		2.2
	33 - 82	33 - 82	33 - 82	33 - 82				16 - 49	33 - 82					3.1
	33 - 66	33 - 66	33 - 66	33 - 66				16 - 33	33 - 66					3.2
	49 - 148	49 - 148	49 - 148	49 - 148				33 - 82	49 - 148					4.1
	33 - 131	33 - 131	33 - 131	33 - 131				33 - 66	33 - 131					4.2
														1.1
														1.2
														1.3
	49 - 131	49 - 131	49 - 131	49 - 131				49 - 131	49 - 131					1.4
	49 - 131	49 - 131	49 - 131	49 - 131				49 - 131	<b>49 - 131</b>					1.5
									33 - 98					1.6
														2.1
33 - 131														2.2
														2.3
	16 - 82	16 - 82	16 - 82	16 - 82	7 - 33	7 - 33	7 - 33	7 - 33	16 - 82				7 - 33	2.4
	16 - 82	16 - 82	16 - 82	16 - 82	7 - 33	7 - 33	7 - 33	7 - 33	16 - 82				7 - 33	2.5
													<b>3 - 16</b>	2.6
														2.7
														2.8
														3.1
														3.2
														4.1
											<b>33 - 131</b>	<b>33 - 131</b>		4.2
														4.3
														4.4
														5.1
														5.2
														5.3
														1.1
													7 - 33	1.1
													<b>3 - 26</b>	1.2
													3 - 16	1.3
														2.1
													3 - 26	2.2
														2.3
													3 - 26	2.4
														2.5
														2.6
														1.1
														1.2
														1.3
														1.4
														1.5

Product Finder

Vc

UNC

UNF

UNEF

UN-8

M

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

NPT

NPTF

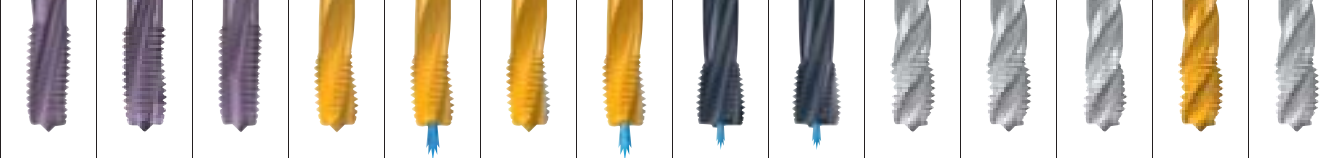
Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info



	Rekord D-TI TiCN	Rekord DF-TILEG TiCN	Rekord DF-NI TiCN	Rekord D-Z TiN	Rekord D-Z-İKZ TiN	Rekord D-Z-BF TiN	Rekord D-Z-BF İKZ-TiN	Rekord D-Z-İKZ LF4-GLT-1	Rekord D-Z-BF-İKZ LF4-GLT-1	Enorm STEEL	Enorm STEEL/E	Enorm STEEL-X	Enorm STEEL TiN	Enorm VA
	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	E/1.5-2	C/2-3	C/2-3	C/2-3
	E/O/P	E/O/P	O/P	E/O/P	E/O	E/O/P	E/O	E/O	E/O	E/O	E/O	E/O	E/O	E/O/P
Thread Depth and Hole Type	max. 2 x d <sub>1</sub> 							max. 4 x d <sub>1</sub> 		max. 2.5 x d <sub>1</sub> 				
UNC	23		23	23	23	23	23			24				
UNF	36		36	36	37	37	37			37				
UNEF, UN-8								45 (UN-8)	45 (UN-8)		44 (UNEF)			
M	59	59	59	59	60	60	60	67	67	61, 69, 74	74	61	61, 71	61, 69, 71
MF					82	82	82	88	88	83			83, 90	83, 90
NPSM/NPSC														
NPSF														
Rp (BSPP)										98			98	98
G														
NPT														
NPTF														
Rc (BSPT)														
STI														
SELF-LOCK														
P	1.1			49 - 148	49 - 148	49 - 148	49 - 148	49 - 148	49 - 148	16 - 82	16 - 82	16 - 82	<b>49 - 148</b>	16 - 82
	2.1			<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	16 - 66	16 - 66	16 - 66	<b>33 - 131</b>	16 - 66
	3.1			<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>				<b>16 - 82</b>	7 - 49
	4.1	16 - 66		<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>					16 - 66
	5.1	<b>7 - 33</b>		7 - 33	7 - 33	7 - 33	7 - 33	7 - 33	7 - 33					
M	1.1			16 - 66	16 - 66	16 - 66	16 - 66	16 - 66	16 - 66				<b>16 - 66</b>	7 - 33
	2.1			16 - 66	16 - 66	16 - 66	16 - 66	16 - 66	16 - 66				<b>16 - 66</b>	7 - 33
	3.1	<b>16 - 49</b>		16 - 49	16 - 49	16 - 49	16 - 49	16 - 49	16 - 49				<b>16 - 49</b>	
	4.1	<b>7 - 33</b>												
K	1.1													
	1.2													
	2.1			<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>				<b>33 - 98</b>	16 - 66
	2.2	33 - 82		<b>33 - 82</b>	<b>33 - 82</b>	<b>33 - 82</b>	<b>33 - 82</b>	<b>33 - 82</b>	<b>33 - 82</b>				33 - 82	
	3.1													
	3.2													
	4.1													
	4.2													
N	1.1													
	1.2													
	1.3													
	1.4				<b>49 - 131</b>	<b>49 - 131</b>	<b>49 - 131</b>	<b>49 - 131</b>	<b>49 - 131</b>	<b>49 - 131</b>				
	1.5				49 - 131	49 - 131	49 - 131	49 - 131	49 - 131	49 - 131				
	1.6				33 - 98	33 - 98	33 - 98	33 - 98	33 - 98	33 - 98				
	2.1													
	2.2										<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>66 - 197</b>
	2.3													
	2.4	<b>16 - 82</b>			16 - 82	16 - 82	16 - 82	16 - 82	16 - 82	16 - 82				<b>16 - 82</b>
	2.5	<b>16 - 82</b>			16 - 82	16 - 82	16 - 82	16 - 82	16 - 82	16 - 82				<b>16 - 82</b>
	2.6													
	2.7	<b>7 - 33</b>												
	2.8			3 - 16										
	3.1													
3.2														
4.1														
4.2														
4.3														
4.4														
5.1														
5.2														
5.3														
S	1.1	16 - 49												
	1.2	<b>7 - 33</b>												
	1.3	<b>3 - 26</b>	<b>7 - 33</b>											
	2.1	7 - 33												
	2.2	7 - 33												
	2.3			<b>3 - 26</b>										
2.4	7 - 33													
2.5			<b>3 - 26</b>											
2.6			<b>3 - 26</b>											
H	1.1													
	1.2													
	1.3													
	1.4													
	1.5													



Product Finder

Vc

UNC

UNF

UNEF

UN-8

M

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info







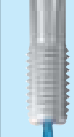













	Enorm Z- IKZ TiCN	Enorm Z/E- IKZ TiCN	Enorm Z GLT-1	Enorm Z/E GLT-1	Enorm Z- IKZ GLT-1	Enorm Z50	Robust 2X-VA	Robust 2X-VA TiN	MULTI Taps	Rekord B-MULTI NT2	Enorm MULTI NE2
	C / 2-3	E / 1.5-2	C / 2-3	E / 1.5-2	C / 2-3	C / 2-3	C / 2-3	C / 2-3		B / 4-5	C / 2-3
	E / 0	E / 0	E	E	E	E / 0 / P	P / 0 2)	P / 0 2)		E / 0 / P	E / 0 / P
Thread Depth and Hole Type	max. 3 x d <sub>1</sub>						max. 1.5 x d <sub>1</sub>			max. 3 x d <sub>1</sub>	max. 2.5 x d <sub>1</sub>
UNC		25	26	26	26		27				
UNF		39	39	39	39		40				
UNEF, UN-8							47 (UN-8)				
M		64	64	64	64	64	66	66		56	65
MF				84		85	86-87	86-87		80	85
NPSM/NPSC											
NPSF											
Rp (BSPP)							99	99			
G											
NPT											
NPTF											
Rc (BSPT)											
STI											
SELF-LOCK											
	1.1	49 - 148	49 - 148	49 - 148	49 - 148	49 - 148	16 - 82	7 - 26	7 - 26	16 - 82	16 - 82
	2.1	33 - 131	33 - 131	33 - 131	33 - 131	33 - 131	16 - 66	7 - 20	7 - 20	16 - 66	16 - 66
	3.1	16 - 82	16 - 82	16 - 82	16 - 82	16 - 82	7 - 49	3 - 26	3 - 26	7 - 49	7 - 49
	4.1	16 - 66	16 - 66	16 - 66	16 - 66	16 - 66	7 - 33	3 - 16	3 - 16		
	5.1										
	1.1	16 - 66	16 - 66	16 - 66	16 - 66	16 - 66	7 - 33	3 - 26	3 - 26	7 - 33	7 - 33
	2.1	16 - 66	16 - 66	16 - 66	16 - 66	16 - 66	7 - 33	3 - 26	3 - 26	7 - 33	7 - 33
	3.1	16 - 49	16 - 49	16 - 49	16 - 49	16 - 49					
	4.1										
	1.1						7 - 33	7 - 33		33 - 82	33 - 82
	1.2						7 - 33	7 - 33		33 - 66	33 - 66
	2.1						7 - 26	7 - 26		16 - 66	16 - 66
	2.2						7 - 26	7 - 26		16 - 49	16 - 49
	3.1						7 - 26	7 - 26		16 - 49	16 - 49
	3.2						7 - 26	7 - 26		16 - 33	16 - 33
	4.1						7 - 33	7 - 33		33 - 82	33 - 82
	4.2						7 - 33	7 - 33		33 - 66	33 - 66
	1.1										
	1.2										
	1.3										
	1.4	49 - 131	49 - 131	49 - 131	49 - 131	49 - 131				33 - 66	33 - 66
	1.5	49 - 131	49 - 131	49 - 131	49 - 131	49 - 131				33 - 66	33 - 66
	1.6	33 - 98	33 - 98	33 - 98	33 - 98	33 - 98					
	2.1	16 - 98	16 - 98	16 - 98	16 - 98	16 - 98	16 - 66				
	2.2	66 - 197	66 - 197	66 - 197	66 - 197	66 - 197					
	2.3										
	2.4	16 - 82	16 - 82	16 - 82	16 - 82	16 - 82				7 - 33	7 - 33
	2.5	16 - 82	16 - 82	16 - 82	16 - 82	16 - 82				7 - 33	7 - 33
	2.6										
	2.7										
	2.8										
	3.1										
	3.2										
	4.1										
	4.2										
	4.3										
	4.4										
	5.1										
	5.2										
	5.3										
	1.1	16 - 49	16 - 49	16 - 49	16 - 49	16 - 49					
	1.2										
	1.3										
	2.1										
	2.2										
	2.3										
	2.4										
	2.5										
	2.6										
	1.1										
	1.2										
	1.3										
	1.4										
	1.5										





- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

		OKO Taps				Carbide Taps					
											
		Rekord A-Z-OKO TiCN	Rekord B-Z-OKO TiN	Enorm Z-OKO TiN	Enorm Z/E-OKO TiN	VHM Rekord A-FK-1KZ	VHM/KHM Rekord A-H-1KZ	VHM/KHM Rekord A-H/E-1KZ	VHM-Rekord A-HCUT/D TiCN	VHM-Rekord A-HCUT/C TiCN 3)	VHM/KHM Rekord D-VA/E-1KZ
		C / 2-3	B / 4-5	C / 2-3	E / 1.5-2	C / 2-3	C / 2-3	E / 1.5-2	D / 4-5	C / 2-3	E / 1.5-2
		E / M / A	E / M / A	E / M / A	E / M / A	E	E / O	E / O	O / P	O / P	E / O
Thread Depth and Hole Type		max. 2 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 		max. 1.5 x d <sub>1</sub> 		max. 1.5 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 
UNC		19	21								
UNF		32	35								
UNEF, UN-8											
M		51	57	65		52	52		53	53	61
MF					85						
NPSM/NPSC											
NPSF											
Rp (BSPP)											
G								96	95	95	
NPT											
NPTF											
Rc (BSPT)											
STI											
SELF-LOCK											
P											
1.1			<b>16 - 82</b>	<b>16 - 82</b>	<b>16 - 82</b>						
2.1		16 - 66	<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>						
3.1		<b>7 - 49</b>	<b>7 - 49</b>	<b>7 - 49</b>	<b>7 - 49</b>						
4.1		<b>7 - 33</b>	<b>7 - 33</b>	7 - 33	7 - 33						
5.1		3 - 16	3 - 16				16 - 49	16 - 49			16 - 49
M											
1.1			<b>7 - 33</b>	<b>7 - 33</b>	<b>7 - 33</b>						
2.1			<b>7 - 33</b>	<b>7 - 33</b>	<b>7 - 33</b>						
3.1			3 - 26	3 - 26	3 - 26						
4.1											
K											
1.1		<b>33 - 82</b>					<b>131 - 262</b>	<b>131 - 262</b>			<b>131 - 262</b>
1.2		<b>33 - 66</b>					<b>98 - 197</b>	<b>98 - 197</b>			<b>98 - 197</b>
2.1		16 - 66	<b>16 - 66</b>				98 - 197	98 - 197			98 - 197
2.2		<b>16 - 49</b>					<b>66 - 131</b>	<b>66 - 131</b>			<b>66 - 131</b>
3.1		<b>16 - 49</b>					<b>66 - 131</b>	<b>66 - 131</b>			<b>66 - 131</b>
3.2		<b>16 - 33</b>					<b>66 - 131</b>	<b>66 - 131</b>			<b>66 - 131</b>
4.1		<b>33 - 82</b>					<b>131 - 262</b>	<b>131 - 262</b>			<b>131 - 262</b>
4.2		<b>33 - 66</b>					<b>98 - 197</b>	<b>98 - 197</b>			<b>98 - 197</b>
N											
1.1											
1.2											
1.3											
1.4		33 - 66	<b>33 - 66</b>	<b>33 - 66</b>	<b>33 - 66</b>						
1.5		<b>33 - 66</b>	33 - 66	33 - 66	33 - 66		<b>66 - 197</b>	<b>66 - 197</b>			<b>66 - 197</b>
1.6		16 - 49					<b>66 - 131</b>	<b>66 - 131</b>			<b>66 - 131</b>
2.1			<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>						
2.2			<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>						
2.3											
2.4			7 - 33	7 - 33	7 - 33						
2.5			7 - 33	7 - 33	7 - 33						
2.6		<b>16 - 66</b>					66 - 131	66 - 131			66 - 131
2.7		3 - 16					16 - 49	16 - 49			16 - 49
2.8							<b>3 - 26</b>	<b>3 - 26</b>			<b>3 - 26</b>
3.1											
3.2											
4.1		16 - 82					<b>66 - 197</b>				
4.2											
4.3							<b>33 - 82</b>				
4.4							<b>16 - 49</b>				
5.1							<b>66 - 197</b>	<b>66 - 197</b>			<b>66 - 197</b>
5.2							33 - 98	33 - 98			33 - 98
5.3											
S											
1.1											
1.2											
1.3											
2.1											
2.2											
2.3											
2.4											
2.5											
2.6											
H											
1.1							3 - 16	3 - 16			
1.2							3 - 10	3 - 10			
1.3									<b>3 - 10</b>	<b>3 - 10</b>	
1.4									<b>3 - 7</b>	<b>3 - 7</b>	
1.5											

1) Threading in through holes is possible only with external cooling/lubrication  
 3) Use solid carbide tap VHM-Rekord A-HCUT/D-TiCN as No. 1 tap!

Tapered Taps



Rekord KEG-STEEL	Rekord KEG-STEEL TIN	Rekord KEG-VA-AZ	Rekord KEG-VA-AZ TIN	Rekord KEG-R15-VA	Rekord KEG-R15-VA TIN	Rekord KEG-R15-VA IKZN-TICN	Rekord KEG-R15-VA-AZ	Rekord KEG-R15-VA-AZ TIN	Rekord KEG-R10-NI TICN
C / 2-3 E / 0	C / 2-3 E / 0	C / 2-3 E / 0	C / 2-3 E / 0	C / 2-3 E / 0	C / 2-3 E / 0	C / 2-3 E / 0	C / 2-3 E / 0	C / 2-3 E / 0	C / 2-3 0 / P



Thread Depth and Hole Type

-	-	-	-	-	-	-	-	-	-
101, 102 104, 105 107	101, 102 104, 105	102 104, 105	102 104, 105	101, 102 105	101, 103 106	103 106	101, 103 106	101, 103 106	103 106

- UNC
- UNF
- UNEF, UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK

<b>7 - 26</b>	<b>7 - 26</b>	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	1.1
<b>7 - 20</b>	<b>7 - 20</b>	<b>7 - 20</b>	<b>7 - 20</b>	<b>7 - 20</b>	<b>7 - 20</b>	<b>7 - 20</b>	<b>7 - 20</b>	<b>7 - 20</b>	<b>7 - 20</b>	2.1
		<b>3 - 26</b>	<b>3 - 26</b>	3 - 26	3 - 26	3 - 26	3 - 26	3 - 26	3 - 26	3.1
		3 - 16	3 - 16							4.1
										5.1

P

		<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	1.1
		<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	<b>3 - 26</b>	2.1
		3 - 16	3 - 16	3 - 16	3 - 16	3 - 16	3 - 16	3 - 16	3 - 16	3.1
									3 - 10	4.1

M

7 - 33 7 - 33	7 - 33 7 - 33	<b>7 - 26</b>	<b>7 - 26</b>	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	1.1
		7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	1.2
		7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	2.1
		7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	7 - 26	2.2
		7 - 33	7 - 33	7 - 33	7 - 33	7 - 33	7 - 33	7 - 33	7 - 33	3.1
		7 - 33	7 - 33	7 - 33	7 - 33	7 - 33	7 - 33	7 - 33	7 - 33	3.2
										4.1
										4.2

K

										1.1
										1.2
										1.3
										1.4
										1.5
										1.6
										2.1
										2.2
										2.3
										2.4
										2.5
										2.6
										2.7
										2.8
										3.1
										3.2
										4.1
										4.2
										4.3
										4.4
										5.1
										5.2
										5.3

N

										1.1
										1.2
										1.3
										2.1
										2.2
									3 - 10	2.3
										2.4
									3 - 10	2.5
									3 - 10	2.6

S

										1.1
										1.2
										1.3
										1.4
										1.5

H

Product Finder

$v_c$

UNC

UNF

UNEF

UN-8

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

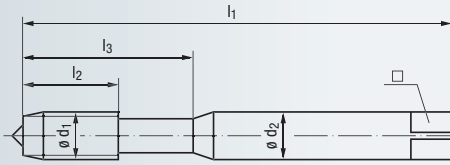
Tech. Info



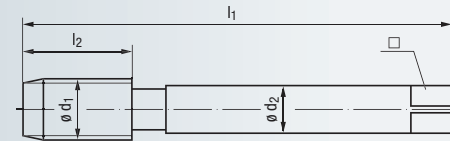
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

Overall length acc. to DIN 371, DIN 376



Reinforced Shank  
(No.1 - 3/8)



Reduced Shank  
(7/16 - 2)

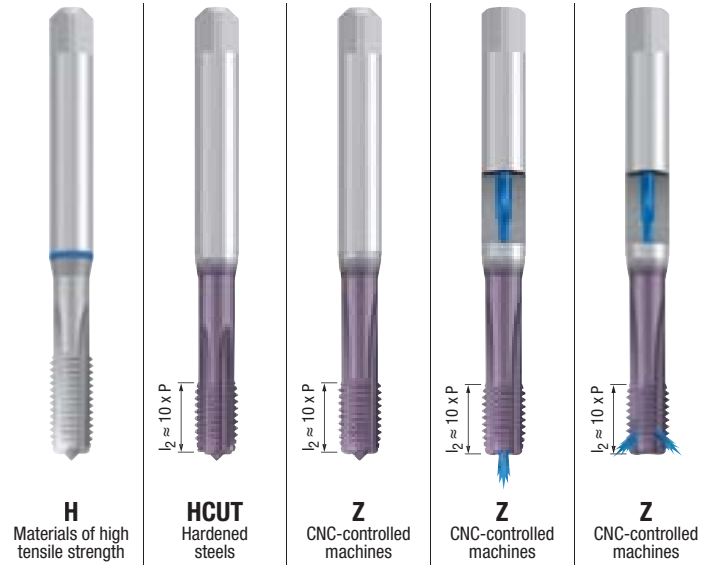


**UNC**  
Unified coarse thread  
ASME B1.1

Class of Fit: 2BX  
Coating: NT, TICN  
Technical Characteristics: C/2-3, E/O/P

Thread Depth and Hole Shape

Range of Application



Model	Material	Coating	Technical Characteristics	Thread Depth and Hole Shape	Range of Application
H	Materials of high tensile strength	NT	C/2-3, E/O/P	max. 2 x d <sub>1</sub>	P 2.1-4.1, K 1.1-4.2, N 2.4-7, N 4.1, 5.1
HCUT	Hardened steels	TICN	HSSE-PM, C/2-3, O/P	max. 1.5 x d <sub>1</sub>	H 1.1-2
Z	CNC-controlled machines	TICN	C/2-3, E/O/P	max. 2 x d <sub>1</sub>	P 2.1-5.1, K 1.1-4.2, N 1.4-6, 2.4-7, N 4.1
Z	CNC-controlled machines	TICN	C/2-3, E/O	max. 2 x d <sub>1</sub>	P 2.1-5.1, K 1.1-4.2, N 1.4-6, 2.4-7, N 4.1
Z	CNC-controlled machines	TICN	C/2-3, E/O	max. 2 x d <sub>1</sub>	P 2.1-5.1, K 1.1-4.2, N 1.4-6, 2.4-7, N 4.1

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification		BU100501		BU10J901		BU109401		BU959401		BU219401		
				l <sub>3</sub>	ø d <sub>2</sub>	Dimens. ID		Rekord 1A-H	Flutes	Rekord 1A-HCUT TICN <sup>2)</sup>	Flutes	Rekord 1A-Z TICN	Flutes	Rekord 1A-Z-1KZ TICN	Flutes	Rekord 1A-Z-1KZN TICN	Flutes			
No. 1	64	1.772	0.276	0.472	0.141	0.110	0.0595	.5000	●	2										
No. 2	56	1.772	0.276	0.472	0.141	0.110	0.0700	.5001	●	3										
No. 3	48	1.969	0.354	0.551	0.141	0.110	0.0820	.5002	●	3										
No. 4	40	2.205	0.433	0.709	0.141	0.110	0.0890	.5003	●	3										
No. 5	40	2.205	0.433	0.709	0.141	0.110	0.1015	.5004	●	3				●	3					
No. 6	32	2.205	0.472	0.787	0.141	0.110	0.1110	.5005	●	3				●	3					
No. 8	32	2.480	0.512	0.827	0.168	0.131	0.1360	.5006	●	3				●	3					
No.10	24	2.756	0.591	0.984	0.194	0.152	0.1520	.5007	●	3				●	3	●	3	●	3	
No.12	24	3.150	0.630	1.142	0.220	0.165	0.1770	.5008	●	3										
1/4	20	3.150	0.669	1.181	0.255	0.191	0.2040	.5009	●	3	●	4	●	3	●	3	●	3	●	3
5/16	18	3.543	0.787	1.378	0.318	0.238	0.2610	.5010	●	3	●	5	●	3	●	3	●	3	●	3
3/8	16	3.937	0.866	1.535	0.381	0.286	0.3160	.5011	●	3	●	5	●	3	●	3	●	3	●	3

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification		CU100501		CU10J901		CU109401		CU959401		CU219401		
				l <sub>3</sub>	ø d <sub>2</sub>	Dimens. ID		Rekord 2A-H	Flutes	Rekord 2A-HCUT TICN <sup>2)</sup>	Flutes	Rekord 2A-Z TICN	Flutes	Rekord 2A-Z-1KZ TICN	Flutes	Rekord 2A-Z-1KZN TICN	Flutes			
7/16	14	3.937	0.866	—	0.323	0.242	0.3680	.5012	●	3	●	5	●	3	●	3	●	3	●	3
1/2	13	4.331	0.984	—	0.367	0.275	0.4219	.5013	●	3	●	5	●	3	●	3	●	3	●	3
9/16	12	4.331	1.024	—	0.429	0.322	0.4844	.5014	●	3			●	3	●	3	●	3	●	3
5/8	11	4.331	1.063	—	0.480	0.360	0.5313	.5015	●	3			●	3	●	3	●	3	●	3
3/4	10	4.921	1.181	—	0.590	0.442	0.6563	.5016	●	4			●	4	●	4	●	4	●	4
7/8	9	5.512	1.260	—	0.697	0.523	0.7656	.5017	●	4			●	4						
1	8	6.299	1.417	—	0.800	0.600	0.8750	.5018	●	4										
1 1/8	7	7.087	1.575	—	0.896	0.672	0.9843	.5019												
1 1/4	7	7.087	1.575	—	1.021	0.766	1.1094	.5020												
1 3/8	6	7.874	1.969	—	1.108	0.831	1.2205	.5021												
1 1/2	6	7.874	1.969	—	1.233	0.925	1.3386	.5022												
1 3/4	5	8.661	2.283	—	1.430	1.072	1.5551	.5023												
2	4 1/2	9.843	2.559	—	1.644	1.233	1.7812	.5024												

1) Threading in through holes is possible only with external cooling/lubrication  
2) Increase drill diameter for taps Rekord 1/2A-HCUT-TICN by 0.004 in



2BX TICN C / 2-3 E / 0	2BX TICN <b>E / 1.5-2</b> E / 0	2BX TICN C / 2-3 E / 0	2BX TICN C / 2-3 E / M / A	2B B / 4-5 E / 0	<b>3B</b> B / 4-5 E / 0	<b>3B</b> CRN B / 4-5 E / 0	2B TIN B / 4-5 E / 0	Class of Fit Coating Technical Characteristics
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<b>K 1.1-4.2</b> N 1.4-6 N 2.3, 2.6	<b>K 1.1-4.2</b> N 1.4-6 N 2.3, 2.6	<b>K 1.1-4.2</b> N 1.4-6 N 2.3, 2.6	<b>P 2.1-5.1</b> <b>K 1.1-4.2</b> N 1.4-6, 2.6-7 N 4.1	<b>P 1.1-2.1</b> N 2.2	<b>P 1.1-2.1</b> N 2.2	<b>P 1.1-4.1</b> N 1.4-5 N 2.2, 2.4-5	<b>P 1.1-4.1</b> <b>M 1.1-3.1</b> <b>K 2.1-2.2</b> N 1.4-5 N 2.2, 2.4-5	Range of Application
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BW159401		BW169401		BW179401		BU339401		BU201000		BU201010		BU201710		BU201400		Tool Identification		
Rekord 1A-SPEED IKZ-TICN	Flutes	Rekord 1A-SPEED/E IKZ-TICN	Flutes	Rekord 1A-SPEED IKZN-TICN	Flutes	Rekord 1A-Z-OKO TICN	Flutes	Rekord 1B-STEEL	Flutes	Rekord 1B-STEEL	Flutes	Rekord 1B-STEEL CRN	Flutes	Rekord 1B-STEEL TIN	Flutes	Dimens. ID	Nominal Size $\varnothing d_1$	T.P.I.
●								●	2	●	2			●	2	.5000	No. 1	64
								●	2	●	2			●	2	.5001	No. 2	56
								●	2	●	2			●	2	.5002	No. 3	48
								●	2	●	2			●	2	.5003	No. 4	40
								●	3	●	3			●	3	.5004	No. 5	40
								●	3	●	3			●	3	.5005	No. 6	32
								●	3	●	3			●	3	.5006	No. 8	32
						●	3	●	3	●	3	●	3	●	3	.5007	No. 10	24
						●	3	●	3	●	3	●	3	●	3	.5008	No. 12	24
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5009	1/4	20
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5010	5/16	18
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5011	3/8	16

CW159401		CW169401		CW179401		CU339401		CU201000		CU201010		CU201710		CU201400		Tool Identification		
Rekord 2A-SPEED IKZ-TICN	Flutes	Rekord 2A-SPEED/E IKZ-TICN	Flutes	Rekord 2A-SPEED IKZN-TICN	Flutes	Rekord 2A-Z-OKO TICN	Flutes	Rekord 2B-STEEL	Flutes	Rekord 2B-STEEL	Flutes	Rekord 2B-STEEL CRN	Flutes	Rekord 2B-STEEL TIN	Flutes	Dimens. ID	Nominal Size $\varnothing d_1$	T.P.I.
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5012	7/16	14
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5013	1/2	13
●	3	●	3	●	3			●	3	●	3	●	3	●	3	.5014	9/16	12
●	3	●	3	●	3			●	3	●	3	●	3	●	3	.5015	5/8	11
●	4	●	4	●	4	●	4	●	3	●	3	●	3	●	3	.5016	3/4	10
●	4	●	4	●	4			●	3	●	3	●	3	●	3	.5017	7/8	9
●	4	●	4	●	4			●	3	●	3	●	3	●	3	.5018	1	8
								●	3	●	3	●	3	●	3	.5019	1 1/8	7
								●	4			●	4	●	4	.5020	1 1/4	7
								●	4			●	4	●	4	.5021	1 3/8	6
								●	4			●	4	●	4	.5022	1 1/2	6
								●	4			●	4	●	4	.5023	1 3/4	5
								●	4			●	4	●	4	.5024	2	4 1/2

● = In stock

1) Threading in through holes is possible only with external cooling/lubrication

Product Finder

Vc

UNC

UNF

UNEF

UN-8

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

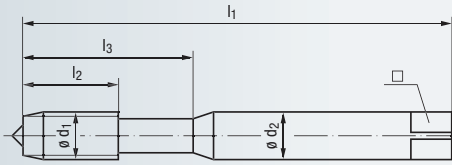
Tech. Info



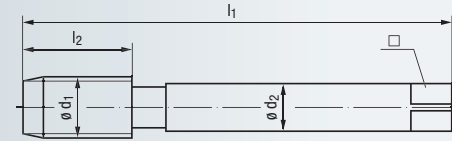
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

Overall length acc. to DIN 371, DIN 376



Reinforced Shank  
(No.1 - 3/a)



Reduced Shank  
(7/16 - 2)



**STEEL**  
Steel materials



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



**Z**  
CNC-controlled machines

l<sub>3</sub> ≈ 10 x P



# UNC

Unified coarse thread  
ASME B1.1

Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

<b>3B</b>	2B	<b>3B</b>	2B	2BX
TIN	NT	NT	TICN	TIN
B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / 4-5
E / 0	E / 0 / P	E / 0 / P	E / 0	E / 0 / P

max. 3 x d<sub>1</sub>



Range of Application

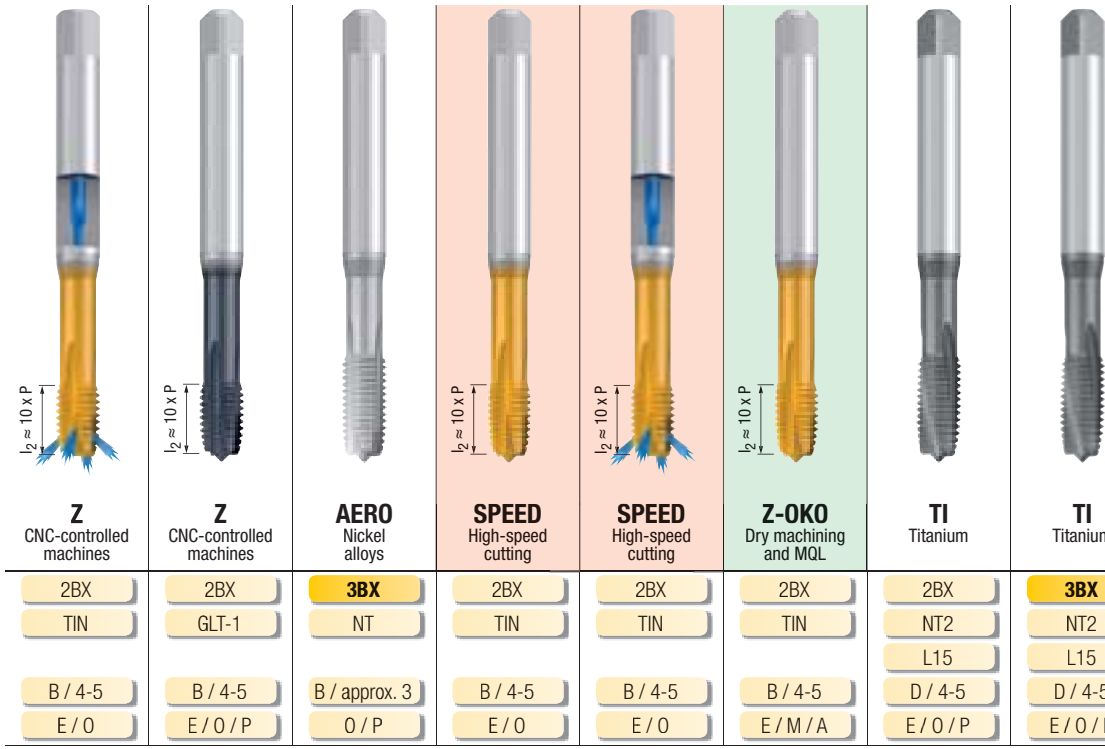
<b>P 1.1-4.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-5.1</b>
<b>M 1.1-3.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>
<b>K 2.1-2.2</b>	<b>K 2.1</b>	<b>K 2.1</b>	<b>K 2.1-2.2</b>	<b>K 2.1</b>
<b>N 1.4-5</b>	<b>N 1.5, 2.4-5</b>	<b>N 1.5, 2.4-5</b>	<b>N 1.4-5</b>	<b>N 1.4-2.2</b>
<b>N 2.2, 2.4-5</b>			<b>N 2.2, 2.4-5</b>	<b>S 1.1</b>

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification		BU201410		BU203000		BU203010		BU089300		BU203701	
				l <sub>3</sub>	ø d <sub>2</sub>	□		Rekord 1B-STEEL TIN	Flutes	Rekord 1B-VA	Flutes	Rekord 1B-VA	Flutes	Rekord 1B-VA-IKZN TICN	Flutes	Rekord 1B-Z TIN	Flutes		
No. 1	64	1.772	0.276	0.472	0.141	0.110	0.0595	.5000			●	2	●	2					
No. 2	56	1.772	0.276	0.472	0.141	0.110	0.0700	.5001			●	2	●	2					
No. 3	48	1.969	0.354	0.551	0.141	0.110	0.0820	.5002			●	2	●	2					
No. 4	40	2.205	0.433	0.709	0.141	0.110	0.0890	.5003			●	2	●	2				●	2
No. 5	40	2.205	0.433	0.709	0.141	0.110	0.1015	.5004			●	3	●	3				●	3
No. 6	32	2.205	0.472	0.787	0.141	0.110	0.1110	.5005			●	3	●	3				●	3
No. 8	32	2.480	0.512	0.827	0.168	0.131	0.1360	.5006			●	3	●	3				●	3
No.10	24	2.756	0.591	0.984	0.194	0.152	0.1520	.5007	●	3	●	3	●	3	●	3	●	●	3
No.12	24	3.150	0.630	1.142	0.220	0.165	0.1770	.5008	●	3	●	3	●	3	●	3	●	●	3
1/4	20	3.150	0.669	1.181	0.255	0.191	0.2040	.5009	●	3	●	3	●	3	●	3	●	●	3
5/16	18	3.543	0.787	1.378	0.318	0.238	0.2610	.5010	●	3	●	3	●	3	●	3	●	●	4
3/8	16	3.937	0.866	1.535	0.381	0.286	0.3160	.5011	●	3	●	3	●	3	●	3	●	●	4

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification		CU201410		CU203000		CU203010		CU089300		CU203701	
				l <sub>3</sub>	ø d <sub>2</sub>	□		Rekord 2B-STEEL TIN	Flutes	Rekord 2B-VA	Flutes	Rekord 2B-VA	Flutes	Rekord 2B-VA-IKZN TICN	Flutes	Rekord 2B-Z TIN	Flutes		
7/16	14	3.937	0.866	—	0.323	0.242	0.3680	.5012	●	3	●	3	●	3	●	3	●	●	4
1/2	13	4.331	0.984	—	0.367	0.275	0.4219	.5013	●	3	●	3	●	3	●	3	●	●	4
9/16	12	4.331	1.024	—	0.429	0.322	0.4844	.5014			●	3	●	3	●	3		●	4
5/8	11	4.331	1.063	—	0.480	0.360	0.5313	.5015	●	3	●	3	●	3	●	3	●	●	4
3/4	10	4.921	1.181	—	0.590	0.442	0.6563	.5016	●	3	●	3	●	3	●	3	●	●	4
7/8	9	5.512	1.260	—	0.697	0.523	0.7656	.5017	●	3	●	3	●	3	●	3	●	●	4
1	8	6.299	1.417	—	0.800	0.600	0.8750	.5018	●	3	●	3	●	3	●	3	●	●	
1 1/8	7	7.087	1.575	—	0.896	0.672	0.9843	.5019			●	3	●	3	●	3		●	
1 1/4	7	7.087	1.575	—	1.021	0.766	1.1094	.5020			●	4	●	4	●	4		●	
1 3/8	6	7.874	1.969	—	1.108	0.831	1.2205	.5021			●	4	●	4	●	4		●	
1 1/2	6	7.874	1.969	—	1.233	0.925	1.3386	.5022			●	4	●	4	●	4		●	
1 3/4	5	8.661	2.283	—	1.430	1.072	1.5551	.5023			●	4	●	4	●	4		●	
2	4 1/2	9.843	2.559	—	1.644	1.233	1.7812	.5024			●	4	●	4	●	4		●	



<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>AERO</b> Nickel alloys	<b>SPEED</b> High-speed cutting	<b>SPEED</b> High-speed cutting	<b>Z-OKO</b> Dry machining and MQL	<b>TI</b> Titanium	<b>TI</b> Titanium
2BX	2BX	<b>3BX</b>	2BX	2BX	2BX	2BX	<b>3BX</b>
TIN	GLT-1	NT	TIN	TIN	TIN	NT2	NT2
B / 4-5	B / 4-5	B / approx. 3	B / 4-5	B / 4-5	B / 4-5	L15	L15
E / O	E / O / P	O / P	E / O	E / O	E / M / A	E / O / P	E / O / P

Class of Fit  
Coating  
Technical Characteristics  
  
Thread Depth and Hole Shape

max. 3 x d<sub>1</sub>



<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	<b>M 4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-5.1</b>	<b>P 4.1-5.1</b>	<b>P 4.1-5.1</b>
<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>N 2.8</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 3.1-4.1</b>	<b>M 3.1-4.1</b>
<b>K 2.1</b>	<b>K 2.1</b>	<b>S 2.3, 2.5-6</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1</b>	<b>K 2.2</b>	<b>K 2.2</b>
<b>N 1.4-2.2</b>	<b>N 1.4-2.2</b>		<b>N 1.1-2.2</b>	<b>N 1.1-2.2</b>	<b>N 1.4-5</b>	<b>N 2.4-5, 2.7</b>	<b>N 2.4-5, 2.7</b>
<b>S 1.1</b>	<b>S 1.1</b>				<b>N 2.1-2, 2.4-5</b>	<b>S 1.1-2.2, 2.4</b>	<b>S 1.1-2.2, 2.4</b>

Range of Application

BU083701		BU20C401		BU206511		BW133701		BW203701		BW213701		BU306001		BU306011		Tool Identification		
Rekord 1B-Z- IKZN TIN	Flutes	Rekord 1B-Z GLT-1	Flutes	Rekord 1B-AERO	Flutes	Rekord 1B-SPEED TIN	Flutes	Rekord 1B-SPEED IKZN-TIN	Flutes	Rekord 1B-Z-OKO TIN	Flutes	Rekord 1C-TI	Flutes	Rekord 1C-TI	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
												●	2	●	2	.5000	No. 1	64
												●	2	●	2	.5001	No. 2	56
												●	2	●	2	.5002	No. 3	48
												●	2	●	2	.5003	No. 4	40
												●	2	●	2	.5004	No. 5	40
												●	3	●	3	.5005	No. 6	32
												●	3	●	3	.5006	No. 8	32
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5007	No. 10	24
												●	3	●	3	.5008	No. 12	24
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5009	1/4	20
●	4	●	4	●	3	●	4	●	4	●	4	●	3	●	3	.5010	5/16	18
●	4	●	4	●	3	●	4	●	4	●	4	●	3	●	3	.5011	3/8	16

CU083701		CU20C401		CU206511		CW133701		CW203701		CW213701		CU306001		CU306011		Tool Identification		
Rekord 2B-Z- IKZN TIN	Flutes	Rekord 2B-Z GLT-1	Flutes	Rekord 2B-AERO	Flutes	Rekord 2B-SPEED TIN	Flutes	Rekord 2B-SPEED IKZN-TIN	Flutes	Rekord 2B-Z-OKO TIN	Flutes	Rekord 2C-TI	Flutes	Rekord 2C-TI	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
●	4	●	4	●	3	●	4	●	4	●	4	●	3	●	3	.5012	7/16	14
●	4	●	4	●	3	●	4	●	4	●	4	●	3	●	3	.5013	1/2	13
●	4											●	3	●	3	.5014	9/16	12
●	4	●	4	●	3	●	4	●	4	●	4	●	3	●	3	.5015	5/8	11
●	4	●	4	●	3	●	4	●	4	●	4	●	3	●	3	.5016	3/4	10
												●	3	●	3	.5017	7/8	9
												●	3	●	3	.5018	1	8
												●	3	●	3	.5019	1 1/8	7
												●	4	●	4	.5020	1 1/4	7
												●	4	●	4	.5021	1 3/8	6
												●	4	●	4	.5022	1 1/2	6
												●	4	●	4	.5023	1 3/4	5
																.5024	2	4 1/2

● = In stock

Product Finder

v<sub>c</sub>

UNC

UNF

UNEF

UN-8

MP

NPSM/NPSC

NPSF

Rp (BSPP)

G

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

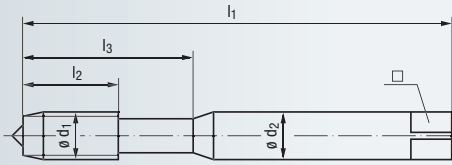
Tech. Info



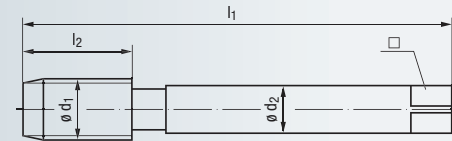
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

Overall length acc. to DIN 371, DIN 376



Reinforced Shank  
(No.1 - 3/8)



Reduced Shank  
(7/16 - 2)



**TI**  
Titanium



**NI**  
Nickel alloys



**STEEL**  
Steel materials



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



**Unified coarse thread  
ASME B1.1**

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

<b>3BX</b>	<b>3BX</b>	2B	2B	2B
TICN	TICN	TIN		TICN
L15	L08	R15	R15	R15
D / 4-5	D / 4-5	C / 2-3	C / 2-3	C / 2-3
E / O / P	O / P	E / O	E / O / P	E / O

max. 3 x d<sub>1</sub>



max. 2 x d<sub>1</sub>



Range of Application

<b>P 4.1-5.1</b>	<b>M 4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-4.1</b>
<b>M 3.1-4.1</b>	<b>N 2.8</b>	<b>M 1.1-3.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-3.1</b>
<b>K 2.2</b>	<b>S 2.3, 2.5-6</b>	<b>K 1.1-4.2</b>	<b>K 2.1</b>	<b>K 1.1-4.2</b>
<b>N 2.4-5, 2.7</b>		<b>N 1.4-5, 2.4-5</b>	<b>N 2.4-5</b>	<b>N 1.4-5, 2.4-5</b>
<b>S 1.1-2.2, 2.4</b>				

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification		BU309611		BU30J411		BU451400		BU453000		BU979300	
				l <sub>3</sub>	ø d <sub>2</sub>	□		Rekord 1C-TI TICN	Flutes	Rekord 1C-NI TICN	Flutes	Rekord 1D-STEEL TIN	Flutes	Rekord 1D-VA	Flutes	Rekord 1D-VA-IKZ TICN	Flutes		
No. 1	64	1.772	0.276	0.472	0.141	0.110	0.0595	.5000						●	2	●	2		
No. 2	56	1.772	0.276	0.472	0.141	0.110	0.0700	.5001						●	2	●	2		
No. 3	48	1.969	0.354	0.551	0.141	0.110	0.0820	.5002						●	2	●	2		
No. 4	40	2.205	0.433	0.709	0.141	0.110	0.0890	.5003	●	2	●	2	●	2	●	2	●	2	
No. 5	40	2.205	0.433	0.709	0.141	0.110	0.1015	.5004	●	2	●	2	●	2	●	2	●	2	
No. 6	32	2.205	0.472	0.787	0.141	0.110	0.1110	.5005	●	3	●	3	●	3	●	3	●	3	
No. 8	32	2.480	0.512	0.827	0.168	0.131	0.1360	.5006	●	3	●	3	●	3	●	3	●	3	
No.10	24	2.756	0.591	0.984	0.194	0.152	0.1520	.5007	●	3	●	3	●	3	●	3	●	3	●
No.12	24	3.150	0.630	1.142	0.220	0.165	0.1770	.5008	●	3	●	3	●	3	●	3	●	3	●
1/4	20	3.150	0.669	1.181	0.255	0.191	0.2040	.5009	●	3	●	3	●	3	●	3	●	3	●
5/16	18	3.543	0.787	1.378	0.318	0.238	0.2610	.5010	●	3	●	3	●	3	●	3	●	3	●
3/8	16	3.937	0.866	1.535	0.381	0.286	0.3160	.5011	●	3	●	3	●	3	●	3	●	3	●

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification		CU309611		CU30J411		CU451400		CU453000		CU979300	
				l <sub>3</sub>	ø d <sub>2</sub>	□		Rekord 2C-TI TICN	Flutes	Rekord 2C-NI TICN	Flutes	Rekord 2D-STEEL TIN	Flutes	Rekord 2D-VA	Flutes	Rekord 2D-VA-IKZ TICN	Flutes		
7/16	14	3.937	0.866	—	0.323	0.242	0.3680	.5012	●	3	●	3	●	3	●	3	●	3	●
1/2	13	4.331	0.984	—	0.367	0.275	0.4219	.5013	●	3	●	3	●	3	●	3	●	3	●
9/16	12	4.331	1.024	—	0.429	0.322	0.4844	.5014	●	3	●	3	●	3	●	3	●	3	●
5/8	11	4.331	1.063	—	0.480	0.360	0.5313	.5015	●	3	●	3	●	3	●	3	●	3	●
3/4	10	4.921	1.181	—	0.590	0.442	0.6563	.5016	●	3	●	3	●	3	●	3	●	3	●
7/8	9	5.512	1.260	—	0.697	0.523	0.7656	.5017											
1	8	6.299	1.417	—	0.800	0.600	0.8750	.5018											
1 1/8	7	7.087	1.575	—	0.896	0.672	0.9843	.5019											
1 1/4	7	7.087	1.575	—	1.021	0.766	1.1094	.5020											
1 3/8	6	7.874	1.969	—	1.108	0.831	1.2205	.5021											
1 1/2	6	7.874	1.969	—	1.233	0.925	1.3386	.5022											
1 3/4	5	8.661	2.283	—	1.430	1.072	1.5551	.5023											
2	4 1/2	9.843	2.559	—	1.644	1.233	1.7812	.5024											



<b>TI</b> Titanium	<b>TI</b> Titanium	<b>TI</b> Titanium	<b>NI</b> Nickel alloys	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	
2BX	<b>3BX</b>	<b>3BX</b>	<b>3BX</b>	2BX	2BX	2BX	2BX	Class of Fit
NT2	NT2	TICN	TICN	TIN	TIN	TIN	TIN	Coating
R15	R15	R15	R10	R15	R15	<b>BF</b> R15	<b>BF</b> R15	Technical Characteristics
C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	
E/O/P	E/O/P	E/O/P	O/P	E/O/P	E/O	E/O/P	E/O	

max. 2 x d<sub>1</sub>



Thread Depth and Hole Shape

<b>P 4.1-5.1</b>	<b>P 4.1-5.1</b>	<b>P 4.1-5.1</b>	<b>N 2.8</b>	<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	Range of Application
<b>M 3.1-4.1</b>	<b>M 3.1-4.1</b>	<b>M 3.1-4.1</b>	<b>S 2.3, 2.5-6</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	
<b>K 2.2</b>	<b>K 2.2</b>	<b>K 2.2</b>		<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>	
<b>N 2.4-5, 2.7</b>	<b>N 2.4-5, 2.7</b>	<b>N 2.4-5, 2.7</b>		<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-6, 2.4-5</b>	
<b>S 1.1-2.2, 2.4</b>	<b>S 1.1-2.2, 2.4</b>	<b>S 1.1-2.2, 2.4</b>						

BU456001		BU456011		BU459611		BU35J411		BU453701		BU973701		BU523701		BU573701		Tool Identification		
Rekord 1D-TI	Flutes	Rekord 1D-TI	Flutes	Rekord 1D-TI TICN	Flutes	Rekord 1DF-NI TICN	Flutes	Rekord 1D-Z TIN	Flutes	Rekord 1D-Z-IKZ TIN	Flutes	Rekord 1D-Z-BF TIN	Flutes	Rekord 1D-Z-BF IKZ-TIN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
●	2	●	2													.5000	No. 1	64
●	2	●	2													.5001	No. 2	56
		●	2													.5002	No. 3	48
●	2	●	2			●	2	●	2			●	2			.5003	No. 4	40
●	2	●	2			●	2	●	2			●	2			.5004	No. 5	40
●	3	●	3			●	3	●	3			●	3			.5005	No. 6	32
●	3	●	3			●	3	●	3			●	3			.5006	No. 8	32
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5007	No. 10	24
●	3	●	3													.5008	No. 12	24
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5009	1/4	20
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5010	5/16	18
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5011	3/8	16

CU456001		CU456011		CU459611		CU35J411		CU453701		CU973701		CU573701		CU583701		Tool Identification		
Rekord 2D-TI	Flutes	Rekord 2D-TI	Flutes	Rekord 2D-TI TICN	Flutes	Rekord 2DF-NI TICN	Flutes	Rekord 2D-Z TIN	Flutes	Rekord 2D-Z-IKZ TIN	Flutes	Rekord 2D-Z-BF TIN	Flutes	Rekord 2D-Z-BF IKZ-TIN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5012	7/16	14
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5013	1/2	13
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5014	9/16	12
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5015	5/8	11
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5016	3/4	10
●	3	●	3									●	3	●	3	.5017	7/8	9
		●	3									●	3	●	3	.5018	1	8
												●	3	●	3	.5019	1 1/8	7
												●	4	●	4	.5020	1 1/4	7
												●	4	●	4	.5021	1 3/8	6
												●	4	●	4	.5022	1 1/2	6
																.5023	1 3/4	5
																.5024	2	4 1/2

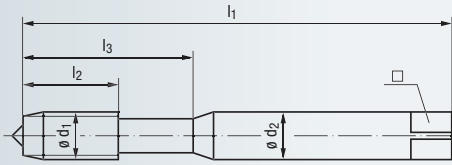
- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



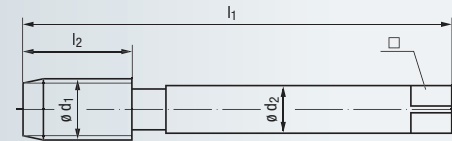
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

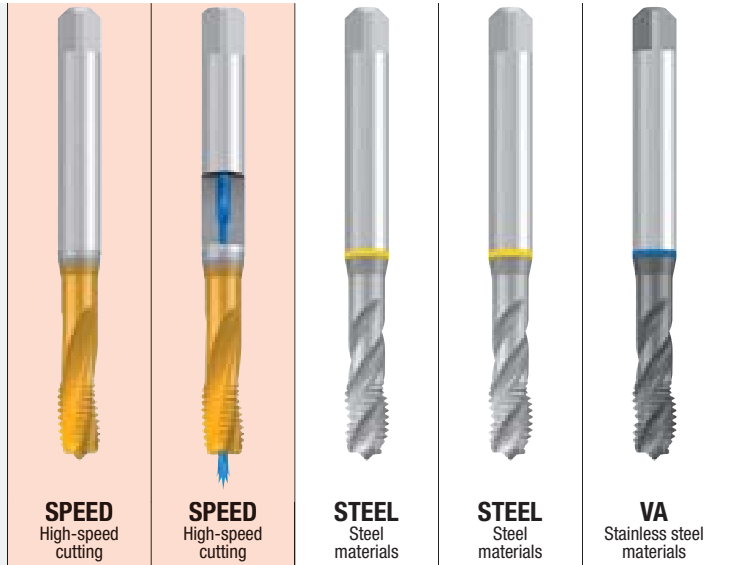
Overall length acc. to DIN 371, DIN 376



Reinforced Shank  
(No.1 - 3/a)



Reduced Shank  
(7/16 - 2)



Class of Fit	2BX	2BX	2B	<b>3B</b>	2B
Coating	TIN	TIN			NE2
Technical Characteristics	R15	R15	R35	R35	R35
	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3
	E/O	E/O	E/O	E/O	E/O/P
Thread Depth and Hole Shape	max. 2 x d <sub>1</sub>		max. 2.5 x d <sub>1</sub>		
Range of Application	P 1.1-4.1 M 1.1-3.1 K 2.1-2 N 1.4-2.1	P 1.1-4.1 M 1.1-3.1 K 2.1-2 N 1.4-2.1	P 1.1-2.1 N 2.2	P 1.1-2.1 N 2.2	P 1.1-3.1 M 1.1-2.1 K 2.1

# UNC

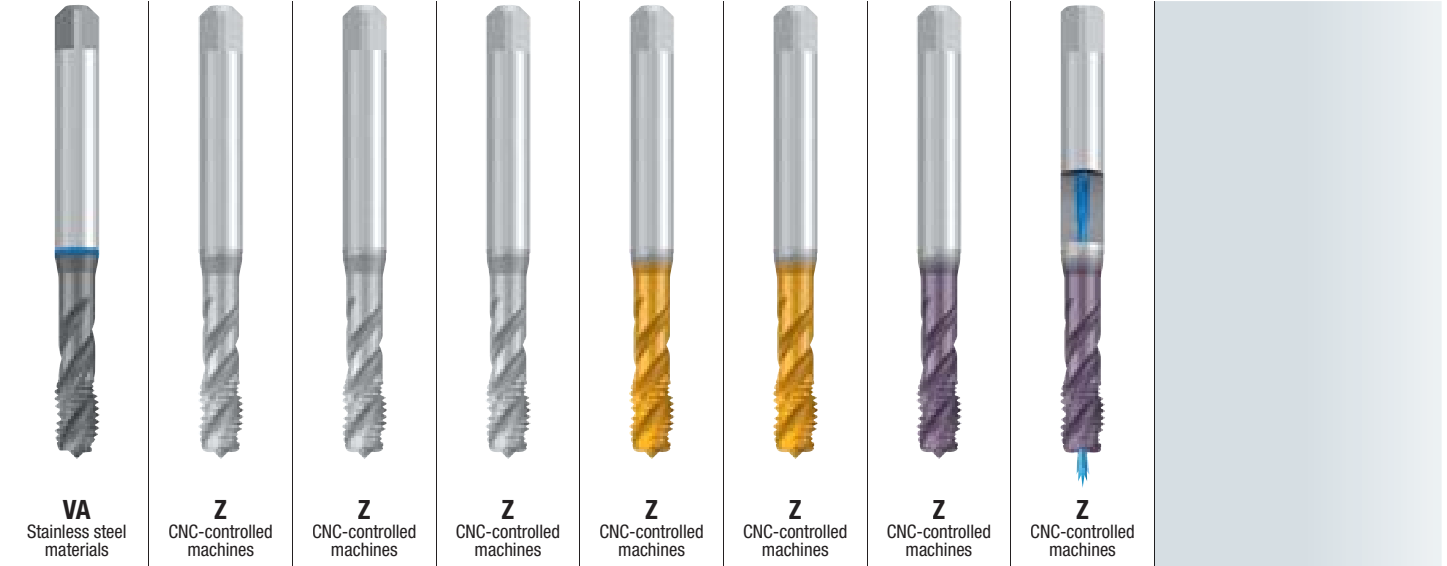
**Unified coarse thread  
ASME B1.1**

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification		BU263701		BU293701		BU501000		BU501010		BU503200	
				l <sub>3</sub>	ø d <sub>2</sub>			Rekord 1D-SPEED TIN	Flutes	Rekord 1D-SPEED IKZ-TIN	Flutes	Enorm 1-STEEL	Flutes	Enorm 1-STEEL	Flutes	Enorm 1-VA NE2	Flutes		
No. 1	64	1.772	0.177	0.472	0.141	0.110	0.0595	.5000						●	2	●	2	●	2
No. 2	56	1.772	0.177	0.472	0.141	0.110	0.0700	.5001						●	2	●	2	●	2
No. 3	48	1.969	0.197	0.551	0.141	0.110	0.0820	.5002						●	2	●	2	●	2
No. 4	40	2.205	0.236	0.709	0.141	0.110	0.0890	.5003	●	2				●	2	●	2	●	2
No. 5	40	2.205	0.276	0.709	0.141	0.110	0.1015	.5004	●	2				●	3	●	3	●	3
No. 6	32	2.205	0.276	0.787	0.141	0.110	0.1110	.5005	●	3				●	3	●	3	●	3
No. 8	32	2.480	0.315	0.827	0.168	0.131	0.1360	.5006	●	3				●	3	●	3	●	3
No.10	24	2.756	0.394	0.984	0.194	0.152	0.1520	.5007	●	3	●	3		●	3	●	3	●	3
No.12	24	3.150	0.394	1.142	0.220	0.165	0.1770	.5008	●	3				●	3	●	3	●	3
1/4	20	3.150	0.512	1.181	0.255	0.191	0.2040	.5009	●	3	●	3		●	3	●	3	●	3
5/16	18	3.543	0.551	1.378	0.318	0.238	0.2610	.5010	●	3	●	3		●	3	●	3	●	3
3/8	16	3.937	0.630	1.535	0.381	0.286	0.3160	.5011	●	3	●	3		●	3	●	3	●	3

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification		CU263701		CU293701		CU501000		CU501010		CU503200	
				l <sub>3</sub>	ø d <sub>2</sub>			Rekord 2D-SPEED TIN	Flutes	Rekord 2D-SPEED IKZ-TIN	Flutes	Enorm 2-STEEL	Flutes	Enorm 2-STEEL	Flutes	Enorm 2-VA NE2	Flutes		
7/16	14	3.937	0.709	—	0.323	0.242	0.3680	.5012	●	3	●	3		●	3	●	3	●	3
1/2	13	4.331	0.787	—	0.367	0.275	0.4219	.5013	●	3	●	3		●	3	●	3	●	3
9/16	12	4.331	0.787	—	0.429	0.322	0.4844	.5014						●	3	●	3	●	3
5/8	11	4.331	0.866	—	0.480	0.360	0.5313	.5015	●	3	●	3		●	3	●	3	●	3
3/4	10	4.921	0.984	—	0.590	0.442	0.6563	.5016			●	3		●	3	●	3	●	3
7/8	9	5.512	1.063	—	0.697	0.523	0.7656	.5017						●	4	●	4	●	4
1	8	6.299	1.181	—	0.800	0.600	0.8750	.5018						●	4			●	4
1 1/8	7	7.087	1.378	—	0.896	0.672	0.9843	.5019						●	4			●	4
1 1/4	7	7.087	1.378	—	1.021	0.766	1.1094	.5020						●	4			●	4
1 3/8	6	7.874	1.575	—	1.108	0.831	1.2205	.5021						●	4			●	4
1 1/2	6	7.874	1.575	—	1.233	0.925	1.3386	.5022						●	4			●	4
1 3/4	5	8.661	1.772	—	1.430	1.072	1.5551	.5023						●	5			●	5
2	4 1/2	9.843	1.969	—	1.644	1.233	1.7812	.5024						●	5			●	5



<b>VA</b> Stainless steel materials	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines
<b>3B</b>	2B	2B	<b>3B</b>	2B	2B	2B	2B
NE2				TIN	TIN	TICN	TICN
R35	R45	R45	R45	R45	R45	R45	R45
C / 2-3	C / 2-3	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>	C / 2-3	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>
E / O / P	E / O / P	E / O / P	E / O / P	E / O / P	E / O / P	E / O / P	E / O
max. 2.5 x d <sub>1</sub>							max. 3 x d <sub>1</sub>
Class of Fit Coating Technical Characteristics 							
Thread Depth and Hole Shape							

<b>P 1.1-3.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>
<b>K 2.1</b>	<b>N 2.1</b>	<b>N 2.1</b>	<b>N 2.1</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>
				<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>
				<b>S 1.1</b>	<b>S 1.1</b>	<b>S 1.1</b>	<b>S 1.1</b>
Range of Application							

BU503210		BU513500		BU513510		BU513700		BU519400		BU999400		Tool Identification		
Enorm 1-VA NE2	Flutes	Enorm 1-Z/E	Flutes	Enorm 1-Z/E	Flutes	Enorm 1-Z/E TIN	Flutes	Enorm 1-Z/E TICN	Flutes	Enorm 1-Z/E-IKZ TICN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
●	2	●	2			●	2					.5000	No. 1	64
●	2	●	2			●	2					.5001	No. 2	56
●	2	●	2			●	2	●	2			.5002	No. 3	48
●	2	●	2	●	2	●	2	●	2			.5003	No. 4	40
●	3	●	3	●	3	●	3	●	3			.5004	No. 5	40
●	3	●	3	●	3	●	3	●	3			.5005	No. 6	32
●	3	●	3	●	3	●	3	●	3			.5006	No. 8	32
●	3	●	3	●	3	●	3	●	3	●	3	.5007	No. 10	24
●	3	●	3	●	3	●	3	●	3	●	3	.5008	No. 12	24
●	3	●	3	●	3	●	3	●	3	●	3	.5009	1/4	20
●	3	●	3	●	3	●	3	●	3	●	3	.5010	5/16	18
●	3	●	3	●	3	●	3	●	3	●	3	.5011	3/8	16

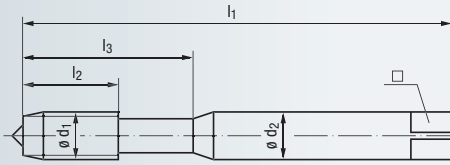
CU503210		CU503500		CU513500		CU513510		CU503700		CU513700		CU519400		CU999400		Tool Identification		
Enorm 2-VA NE2	Flutes	Enorm 2-Z	Flutes	Enorm 2-Z/E	Flutes	Enorm 2-Z/E	Flutes	Enorm 2-Z/E TIN	Flutes	Enorm 2-Z/E TICN	Flutes	Enorm 2-Z/E-IKZ TICN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.		
●	3			●	4	●	4			●	4	●	4	.5012	7/16	14		
●	3			●	4	●	4			●	4	●	4	.5013	1/2	13		
●	3			●	4	●	4			●	4	●	4	.5014	9/16	12		
●	3			●	4	●	4			●	4	●	4	.5015	5/8	11		
●	3			●	4	●	4			●	4	●	4	.5016	3/4	10		
●	4			●	5	●	5			●	5	●	5	.5017	7/8	9		
●	4			●	5	●	5			●	5	●	5	.5018	1	8		
●	4	●	5					●	5					.5019	1 1/8	7		
●	4	●	5					●	5					.5020	1 1/4	7		
●	4	●	5					●	5					.5021	1 3/8	6		
●	4	●	5					●	5					.5022	1 1/2	6		
●	5	●	6					●	6					.5023	1 3/4	5		
●	5	●	6					●	6					.5024	2	4 1/2		

● = In stock

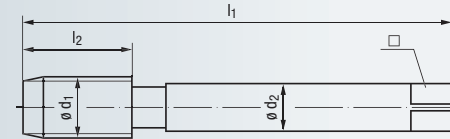
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- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

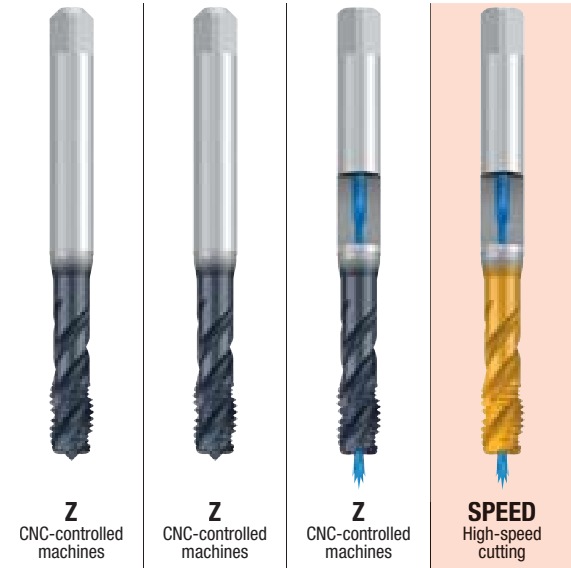
Overall length acc. to DIN 371, DIN 376



Reinforced Shank  
(No. 1 - 3/8)



Reduced Shank  
(7/16 - 2)



**Z** CNC-controlled machines  
**Z** CNC-controlled machines  
**Z** CNC-controlled machines  
**SPEED** High-speed cutting

# UNC

**Unified coarse thread  
ASME B1.1**

Class of Fit	2B	2B	2B	2B																			
Coating	GLT-1	GLT-1	GLT-1	TIN																			
Technical Characteristics	R45	R45	R45	R45																			
	C / 2-3	<b>E / 1.5-2</b>	C / 2-3	C / 2-3																			
	E	E	E	E / 0																			
Thread Depth and Hole Shape	max. 3 x d <sub>1</sub> 																						
Range of Application	<table border="1"> <tr><td>P 1.1-4.1</td></tr> <tr><td>M 1.1-3.1</td></tr> <tr><td>N 1.4-6</td></tr> <tr><td>N 2.1-2, 2.4-5</td></tr> <tr><td>S 1.1</td></tr> </table>	P 1.1-4.1	M 1.1-3.1	N 1.4-6	N 2.1-2, 2.4-5	S 1.1	<table border="1"> <tr><td>P 1.1-4.1</td></tr> <tr><td>M 1.1-3.1</td></tr> <tr><td>N 1.4-6</td></tr> <tr><td>N 2.1-2, 2.4-5</td></tr> <tr><td>S 1.1</td></tr> </table>	P 1.1-4.1	M 1.1-3.1	N 1.4-6	N 2.1-2, 2.4-5	S 1.1	<table border="1"> <tr><td>P 1.1-4.1</td></tr> <tr><td>M 1.1-3.1</td></tr> <tr><td>N 1.4-6</td></tr> <tr><td>N 2.1-2, 2.4-5</td></tr> <tr><td>S 1.1</td></tr> </table>	P 1.1-4.1	M 1.1-3.1	N 1.4-6	N 2.1-2, 2.4-5	S 1.1	<table border="1"> <tr><td>P 1.1-4.1</td></tr> <tr><td>M 1.1-3.1</td></tr> <tr><td>K 2.1</td></tr> <tr><td>N 1.1-2.2</td></tr> </table>	P 1.1-4.1	M 1.1-3.1	K 2.1	N 1.1-2.2
P 1.1-4.1																							
M 1.1-3.1																							
N 1.4-6																							
N 2.1-2, 2.4-5																							
S 1.1																							
P 1.1-4.1																							
M 1.1-3.1																							
N 1.4-6																							
N 2.1-2, 2.4-5																							
S 1.1																							
P 1.1-4.1																							
M 1.1-3.1																							
N 1.4-6																							
N 2.1-2, 2.4-5																							
S 1.1																							
P 1.1-4.1																							
M 1.1-3.1																							
K 2.1																							
N 1.1-2.2																							

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification		BU50C400		BU51C400		BU94C400		BW553700	
				l <sub>3</sub>	ø d <sub>2</sub>	□		Enorm 1-Z GLT-1	Flutes	Enorm 1-Z/E GLT-1	Flutes	Enorm 1-Z-1KZ GLT-1	Flutes	Enorm 1-SPEED IKZ-TIN	Flutes		
No. 1	64	1.772	0.177	0.472	0.141	0.110	0.0595	.5000									
No. 2	56	1.772	0.177	0.472	0.141	0.110	0.0700	.5001									
No. 3	48	1.969	0.197	0.551	0.141	0.110	0.0820	.5002									
No. 4	40	2.205	0.236	0.709	0.141	0.110	0.0890	.5003	●	2	●	2					
No. 5	40	2.205	0.276	0.709	0.141	0.110	0.1015	.5004	●	3	●	3					
No. 6	32	2.205	0.276	0.787	0.141	0.110	0.1110	.5005	●	3	●	3					
No. 8	32	2.480	0.315	0.827	0.168	0.131	0.1360	.5006	●	3	●	3					
No. 10	24	2.756	0.394	0.984	0.194	0.152	0.1520	.5007	●	3	●	3	●	3			
No. 12	24	3.150	0.394	1.142	0.220	0.165	0.1770	.5008									
1/4	20	3.150	0.512	1.181	0.255	0.191	0.2040	.5009	●	3	●	3	●	3	●	3	
5/16	18	3.543	0.551	1.378	0.318	0.238	0.2610	.5010	●	3	●	3	●	3	●	3	
3/8	16	3.937	0.630	1.535	0.381	0.286	0.3160	.5011	●	3	●	3	●	3	●	3	

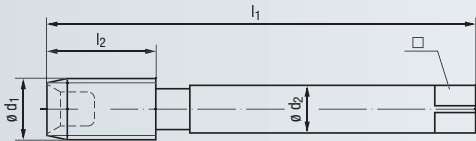
### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification		CU50C400		CU51C400		CU94C400		CW553700	
				l <sub>3</sub>	ø d <sub>2</sub>	□		Enorm 2-Z GLT-1	Flutes	Enorm 2-Z/E GLT-1	Flutes	Enorm 2-Z-1KZ GLT-1	Flutes	Enorm 2-SPEED IKZ-TIN	Flutes		
7/16	14	3.937	0.709	—	0.323	0.242	0.3680	.5012	●	4	●	4	●	4	●	4	
1/2	13	4.331	0.787	—	0.367	0.275	0.4219	.5013	●	4	●	4	●	4	●	4	
9/16	12	4.331	0.787	—	0.429	0.322	0.4844	.5014	●	4	●	4	●	4	●	4	
5/8	11	4.331	0.866	—	0.480	0.360	0.5313	.5015	●	4	●	4	●	4	●	4	
3/4	10	4.921	0.984	—	0.590	0.442	0.6563	.5016	●	4	●	4	●	4	●	4	
7/8	9	5.512	1.063	—	0.697	0.523	0.7656	.5017									
1	8	6.299	1.181	—	0.800	0.600	0.8750	.5018									
1 1/8	7	7.087	1.378	—	0.896	0.672	0.9843	.5019									
1 1/4	7	7.087	1.378	—	1.021	0.766	1.1094	.5020									
1 3/8	6	7.874	1.575	—	1.108	0.831	1.2205	.5021									
1 1/2	6	7.874	1.575	—	1.233	0.925	1.3386	.5022									
1 3/4	5	8.661	1.772	—	1.430	1.072	1.5551	.5023									
2	4 1/2	9.843	1.969	—	1.644	1.233	1.7812	.5024									

**DIN Length - ANSI Shank**

Overall length acc. to DIN 376

With internal chip collector



Reduced Shank



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials

**UNC**



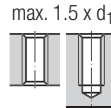
Unified coarse thread  
ASME B1.1

Class of Fit  
Coating  
Technical Characteristics



2BX	<b>3BX</b>
NE2	NE2
C / 2-3	C / 2-3
P / O 1)	P / O 1)

Thread Depth and Hole Shape



Range of Application

<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>
<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>

**Reduced Shank**

Nominal Size $\varnothing d_1$	T.P.I.	inch				Tool Identification		CU803001		CU803011	
		$l_1$	$l_2$	$\varnothing d_2$	$\square$	Robust 2X-VA	Flutes	Robust 2X-VA	Flutes		
3/4	10	4.921	1.181	0.590	0.442	0.6563	.5016	●	5	●	5
7/8	9	5.512	1.260	0.697	0.523	0.7656	.5017	●	5	●	5
1	8	6.299	1.417	0.800	0.600	0.8750	.5018	●	5	●	5
1 1/8	7	7.087	1.575	0.896	0.672	0.9843	.5019	●	5	●	5
1 1/4	7	7.087	1.575	1.021	0.766	1.1094	.5020	●	6	●	6
1 3/8	6	7.874	1.969	1.108	0.831	1.2205	.5021	●	6	●	6
1 1/2	6	7.874	1.969	1.233	0.925	1.3386	.5022	●	6	●	6
1 3/4	5	8.661	2.283	1.430	1.072	1.5551	.5023	●	6	●	6
2	4 1/2	9.843	2.559	1.644	1.233	1.7812	.5024	●	6	●	6

1) If possible, use paste lubrication, coating both the tool and the walls of the drilled hole. Lubrication with oil is possible only in the vertical machining of blind holes, if the hole is entirely filled with oil.

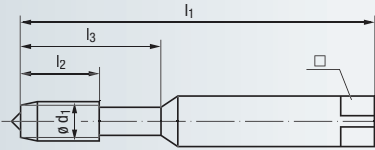
Larger sizes priced upon request. We have experience in making taps as large as 10 inches  $\varnothing$  UN.

**The Complete Tool System**

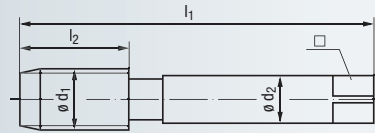
Robust 2X-VA Taps when used with a KSN Type tapping attachment creates the optimal tapping unit!

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

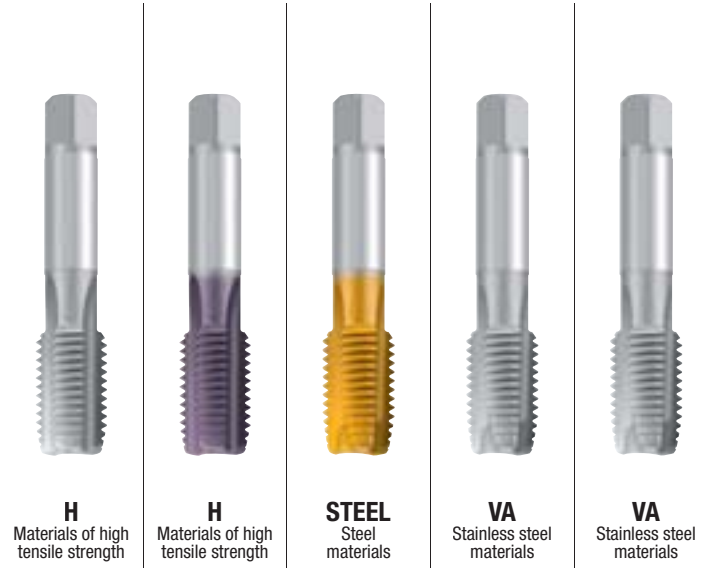
### ANSI Length • ANSI Shank



Reinforced Shank  
(No.4 - 3/8)



Reduced Shank  
(7/16 - 3/4)



**H** Materials of high tensile strength  
**H** Materials of high tensile strength  
**STEEL** Steel materials  
**VA** Stainless steel materials  
**VA** Stainless steel materials



**Unified coarse thread  
ASME B1.1**

Class of Fit  
Coating  
Technical Characteristics

2BX	2BX	2B	2B	<b>3B</b>
NT	TICN	TIN	NT	NT
C / 2-3	C / 2-3	B / 4-5	B / 4-5	B / 4-5
E / O / P	E / O / P	E / O	E / O / P	E / O / P

Thread Depth and Hole Shape



Range of Application

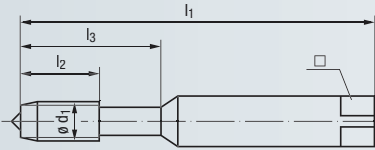
<b>P 2.1-4.1</b>	<b>P 2.1-5.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>
<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>	<b>M 1.1-3.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>
<b>N 2.4-7</b>	<b>N 2.4-7, 4.1</b>	<b>K 2.1-2.2</b>	<b>K 2.1</b>	<b>K 2.1</b>
<b>N 4.1, 5.1</b>		<b>N 1.4-5</b>	<b>N 1.5, 2.4-5</b>	<b>N 1.5, 2.4-5</b>

Nominal Size ø d <sub>1</sub>	T.P.I.	inch							Tool Identification	AU100501		AU109101		AU201400		AU203000		AU203010	
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	□	Rekord A-H	Flutes		Rekord A-H TICN	Flutes	Rekord B-STEEL TIN	Flutes	Rekord B-VA	Flutes	Rekord B-VA	Flutes		
No. 4	40	1 7/8	1.88	0.433	0.709	0.141	0.110	0.0890	.5003	●	3	●	3	●	2	●	2		
No. 5	40	1 15/16	1.94	0.433	0.709	0.141	0.110	0.1015	.5004	●	3	●	3	●	3	●	3		
No. 6	32	2	2.00	0.472	0.748	0.141	0.110	0.1110	.5005	●	3	●	3	●	3	●	3		
No. 8	32	2 1/8	2.13	0.512	0.827	0.168	0.131	0.1360	.5006	●	3	●	3	●	3	●	3		
No. 10	24	2 3/8	2.38	0.591	0.945	0.194	0.152	0.1520	.5007	●	3	●	3	●	3	●	3		
1/4	20	2 1/2	2.50	0.669	1.142	0.255	0.191	0.2040	.5009	●	3	●	3	●	3	●	3	●	3
5/16	18	2 23/32	2.72	0.787	1.299	0.318	0.238	0.2610	.5010	●	3	●	3	●	3	●	3	●	3
3/8	16	2 15/16	2.94	0.866	1.378	0.381	0.286	0.3160	.5011	●	3	●	3	●	3	●	3	●	3
7/16	14	3 5/32	3.16	0.866	—	0.323	0.242	0.3680	.5012	●	3	●	3	●	3	●	3	●	3
1/2	13	3 3/8	3.38	0.984	—	0.367	0.275	0.4219	.5013	●	3	●	3	●	3	●	3	●	3
9/16	12	3 19/32	3.59	1.024	—	0.429	0.322	0.4844	.5014	●	3	●	3	●	3	●	3	●	3
5/8	11	3 13/16	3.81	1.063	—	0.480	0.360	0.5313	.5015	●	3	●	3	●	3	●	3	●	3
3/4	10	4 1/4	4.25	1.181	—	0.590	0.442	0.6563	.5016	●	4	●	4	●	3	●	3		

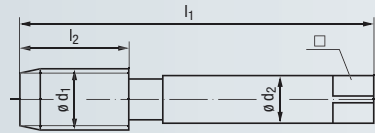


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

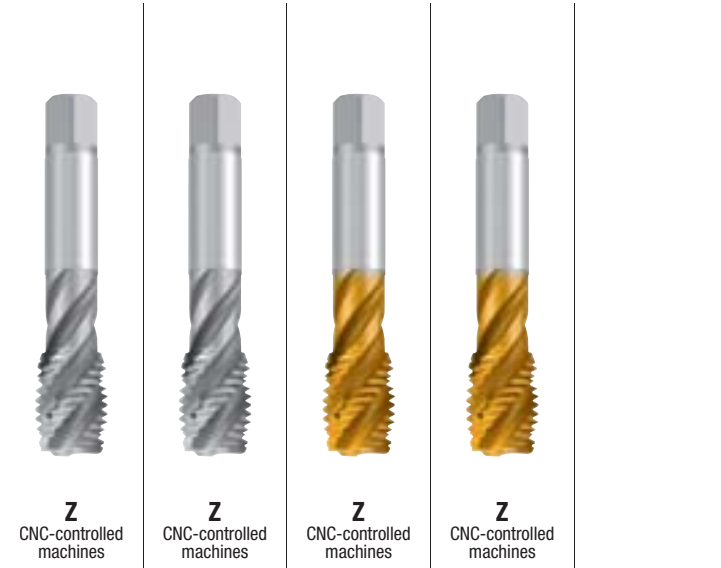
### ANSI Length - ANSI Shank



Reinforced Shank  
(No.4 - 3/8)



Reduced Shank  
(7/16 - 3/4)



**Unified coarse thread  
ASME B1.1**

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

2B	<b>3B</b>	2B	<b>3B</b>
R45	R45	TIN	TIN
<b>E / 1.5-2</b>	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>
E / O / P	E / O / P	E / O / P	E / O / P

max. 3 x d<sub>1</sub>



Range of Application

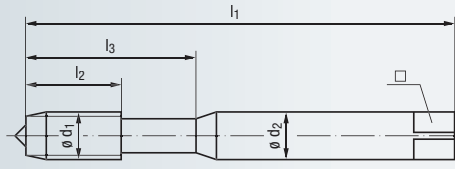
<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>
<b>N 2.1</b>	<b>N 2.1</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>
		<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>
		<b>S 1.1</b>	<b>S 1.1</b>

Nominal Size ø d <sub>1</sub>	T.P.I.	inch							Tool Identification	AU513500		AU513510		AU513700		AU513710	
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	□	Dimens. ID	Enorm Z/E		Flutes	Enorm Z/E	Flutes	Enorm Z/E TIN	Flutes	Enorm Z/E TIN	Flutes	
No. 4	40	1 7/8	1.88	0.236	0.709	0.141	0.110	0.0890	<b>.5003</b>	●	2			●	2		
No. 5	40	1 15/16	1.94	0.276	0.709	0.141	0.110	0.1015	<b>.5004</b>	●	3			●	3		
No. 6	32	2	2.00	0.276	0.748	0.141	0.110	0.1110	<b>.5005</b>	●	3			●	3		
No. 8	32	2 1/8	2.13	0.315	0.827	0.168	0.131	0.1360	<b>.5006</b>	●	3			●	3		
No. 10	24	2 3/8	2.38	0.354	0.945	0.194	0.152	0.1520	<b>.5007</b>	●	3			●	3		
1/4	20	2 1/2	2.50	0.512	1.142	0.255	0.191	0.2040	<b>.5009</b>	●	3	●	3	●	3	●	3
5/16	18	2 23/32	2.72	0.551	1.299	0.318	0.238	0.2610	<b>.5010</b>	●	3			●	3	●	3
3/8	16	2 15/16	2.94	0.630	1.378	0.381	0.286	0.3160	<b>.5011</b>	●	3	●	3	●	3	●	3
7/16	14	3 5/32	3.16	0.709	—	0.323	0.242	0.3680	<b>.5012</b>	●	4	●	4	●	4	●	4
1/2	13	3 3/8	3.38	0.787	—	0.367	0.275	0.4219	<b>.5013</b>	●	4	●	4	●	4	●	4
9/16	12	3 19/32	3.59	0.787	—	0.429	0.322	0.4844	<b>.5014</b>	●	4			●	4		
5/8	11	3 13/16	3.81	0.866	—	0.480	0.360	0.5313	<b>.5015</b>	●	4			●	4		
3/4	10	4 1/4	4.25	0.984	—	0.590	0.442	0.6563	<b>.5016</b>	●	4			●	4		

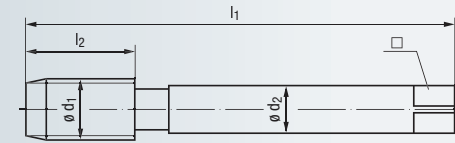


**DIN Length · ANSI Shank**

Overall length acc. to DIN 371, DIN 374



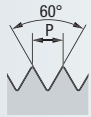
Reinforced Shank  
(No.0 - 3/8)



Reduced Shank  
(7/16 - 1 1/2)

**UNF**

Unified fine thread  
ASME B1.1

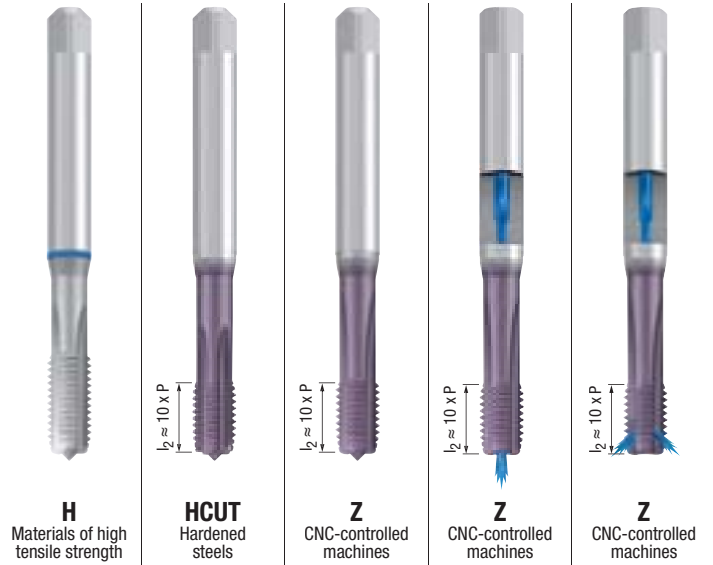


Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

Range of Application



**H** Materials of high tensile strength  
**HCUT** Hardened steels  
**Z** CNC-controlled machines  
**Z** CNC-controlled machines  
**Z** CNC-controlled machines

2BX	2BX	2BX	2BX	2BX
NT	TICN	TICN	TICN	TICN
C / 2-3	<b>HSSE-PM</b>	C / 2-3	C / 2-3	C / 2-3
E / O / P	O / P	E / O / P	E / O	E / O
max. 2 x d <sub>1</sub>	max. 1.5 x d <sub>1</sub>	max. 2 x d <sub>1</sub>	max. 2 x d <sub>1</sub>	max. 2 x d <sub>1</sub>
P 2.1-4.1 K 1.1-4.2 N 2.4-7 N 4.1, 5.1	H 1.1-2	P 2.1-5.1 K 1.1-4.2 N 1.4-6, 2.4-7 N 4.1	P 2.1-5.1 K 1.1-4.2 N 1.4-6, 2.4-7 N 4.1	P 2.1-5.1 K 1.1-4.2 N 1.4-6, 2.4-7 N 4.1

**Reinforced Shank**

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	ø d <sub>2</sub>	□	Tool Identification		BU100501		BU10J901		BU109401		BU959401		BU219401	
							Rekord 1A-H	Flutes	Rekord 1A-HCUT TICN <sup>2)</sup>	Flutes	Rekord 1A-Z TICN	Flutes	Rekord 1A-Z-1KZ TICN	Flutes	Rekord 1A-Z-1KZN TICN	Flutes		
No. 0	80	1.626	0.236	0.433	0.141	0.110	0.0480	.5033	●	2								
No. 1	72	1.772	0.276	0.472	0.141	0.110	0.0595	.5034	●	2								
No. 2	64	1.772	0.276	0.472	0.141	0.110	0.0730	.5035	●	3								
No. 3	56	1.969	0.354	0.551	0.141	0.110	0.0827	.5036	●	3								
No. 4	48	2.205	0.433	0.709	0.141	0.110	0.0945	.5037	●	3								
No. 5	44	2.205	0.433	0.709	0.141	0.110	0.1063	.5038	●	3								
No. 6	40	2.205	0.472	0.787	0.141	0.110	0.1181	.5039	●	3								
No. 8	36	2.480	0.512	0.827	0.168	0.131	0.1378	.5040	●	3								
No. 10	32	2.756	0.512	0.984	0.194	0.152	0.1614	.5041	●	3		●	3	●	3	●	3	
No. 12	28	3.150	0.630	1.142	0.220	0.165	0.1820	.5042	●	3								
1/4	28	3.150	0.669	1.181	0.255	0.191	0.2165	.5043	●	3	●	4	●	3	●	3	●	3
5/16	24	3.543	0.669	1.260	0.318	0.238	0.2717	.5044	●	3	●	5	●	3	●	3	●	3
3/8	24	3.937	0.709	1.535	0.381	0.286	0.3346	.5045	●	4	●	5	●	4	●	4	●	4

**Reduced Shank**

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	ø d <sub>2</sub>	□	Tool Identification		CU100501		CU10J901		CU109401		CU959401		CU219401	
							Rekord 2A-H	Flutes	Rekord 2A-HCUT TICN <sup>2)</sup>	Flutes	Rekord 2A-Z TICN	Flutes	Rekord 2A-Z-1KZ TICN	Flutes	Rekord 2A-Z-1KZN TICN	Flutes		
7/16	20	3.937	0.866	—	0.323	0.242	0.3898	.5046	●	4	●	5	●	4	●	4	●	4
1/2	20	3.937	0.866	—	0.367	0.275	0.4528	.5047	●	4	●	5	●	4	●	4	●	4
9/16	18	3.937	0.866	—	0.429	0.322	0.5118	.5048	●	4	●	5	●	4	●	4	●	4
5/8	18	3.937	0.866	—	0.480	0.360	0.5709	.5049	●	4	●	5	●	4	●	4	●	4
3/4	16	4.331	0.984	—	0.590	0.442	0.6890	.5050	●	4	●	5	●	4	●	4	●	4
7/8	14	4.921	1.024	—	0.697	0.523	0.8071	.5051	●	4	●	5	●	4	●	4	●	4
1	12	5.512	1.102	—	0.800	0.600	0.9219	.5052	●	4	●	5	●	4	●	4	●	4
1 1/8	12	5.906	1.181	—	0.896	0.672	1.0433	.5053	●	4	●	5	●	4	●	4	●	4
1 1/4	12	5.906	1.181	—	1.021	0.766	1.1719	.5054	●	4	●	5	●	4	●	4	●	4
1 3/8	12	6.693	1.299	—	1.108	0.831	1.2992	.5055	●	4	●	5	●	4	●	4	●	4
1 1/2	12	6.693	1.299	—	1.233	0.925	1.4173	.5056	●	4	●	5	●	4	●	4	●	4

● = In stock

1) Threading in through holes is possible only with external cooling/lubrication  
2) Increase drill diameter for taps Rekord 1/2A-HCUT-TICN by 0.004 in

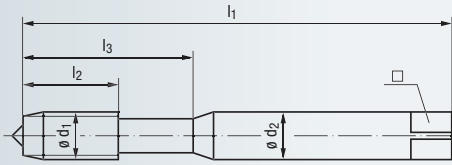
- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- MF
- NPSM/NPSC
- NPSF
- Rp (BSP)
- G
- PT
- NPTF
- Rc (BSP)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



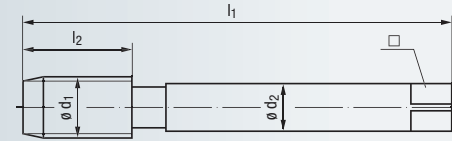
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

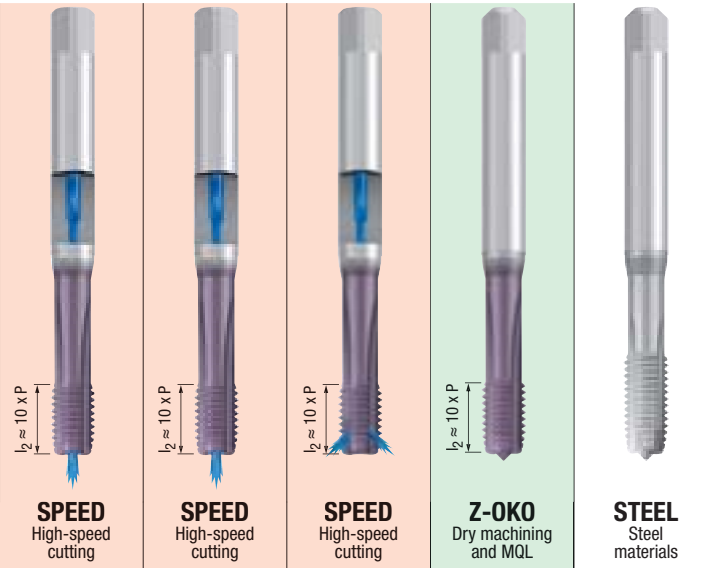
Overall length acc. to DIN 371, DIN 374



Reinforced Shank  
(No.0 - 3/8)



Reduced Shank  
(7/16 - 1 1/2)



**UNF**  
Unified fine thread  
ASME B1.1

Class of Fit  
Coating  
Technical Characteristics  
Thread Depth and Hole Shape

2BX	2BX	2BX	2BX	2B
TICN	TICN	TICN	TICN	
C / 2-3	<b>E / 1.5-2</b>	C / 2-3	C / 2-3	B / 4-5
E / 0	E / 0	E / 0	E / M / A	E / 0
max. 2 x d <sub>1</sub>		max. 2 x d <sub>1</sub>		max. 3 x d <sub>1</sub>
1)				

Range of Application










<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>	<b>P 2.1-5.1</b>	<b>P 1.1-2.1</b>
<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>K 1.1-4.2</b>	<b>N 2.2</b>
<b>N 2.3, 2.6</b>	<b>N 2.3, 2.6</b>	<b>N 2.3, 2.6</b>	<b>N 1.4-6, 2.6-7</b>	
			<b>N 4.1</b>	

### Reinforced Shank

Reinforced Shank							Tool Identification		BW159401		BW169401		BW179401		BU339401		BU201000	
Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	inch ø d <sub>2</sub>	□	Dimens. ID	Rekord 1A-SPEED IKZ-TICN	Flutes	Rekord 1A-SPEED/E IKZ-TICN	Flutes	Rekord 1A-SPEED IKZN-TICN	Flutes	Rekord 1A-Z-OKO TICN	Flutes	Rekord 1B-STEEL	Flutes	
No. 0	80	1.626	0.236	0.433	0.141	0.110	0.0480	.5033									●	2
No. 1	72	1.772	0.276	0.472	0.141	0.110	0.0595	.5034									●	2
No. 2	64	1.772	0.276	0.472	0.141	0.110	0.0730	.5035									●	2
No. 3	56	1.969	0.354	0.551	0.141	0.110	0.0827	.5036									●	2
No. 4	48	2.205	0.433	0.709	0.141	0.110	0.0945	.5037									●	2
No. 5	44	2.205	0.433	0.709	0.141	0.110	0.1063	.5038									●	3
No. 6	40	2.205	0.472	0.787	0.141	0.110	0.1181	.5039									●	3
No. 8	36	2.480	0.512	0.827	0.168	0.131	0.1378	.5040									●	3
No.10	32	2.756	0.512	0.984	0.194	0.152	0.1614	.5041	●	3	●	3	●	3	●	3	●	3
No.12	28	3.150	0.630	1.142	0.220	0.165	0.1820	.5042	●	3	●	3	●	3	●	3	●	3
1/4	28	3.150	0.669	1.181	0.255	0.191	0.2165	.5043	●	3	●	3	●	3	●	3	●	3
5/16	24	3.543	0.669	1.260	0.318	0.238	0.2717	.5044	●	3	●	3	●	3	●	3	●	3
3/8	24	3.937	0.709	1.535	0.381	0.286	0.3346	.5045	●	4	●	4	●	4	●	4	●	4

### Reduced Shank

Reduced Shank							Tool Identification		CW159401		CW169401		CW179401		CU339401		CU201000	
Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	inch ø d <sub>2</sub>	□	Dimens. ID	Rekord 2A-SPEED IKZ-TICN	Flutes	Rekord 2A-SPEED/E IKZ-TICN	Flutes	Rekord 2A-SPEED IKZN-TICN	Flutes	Rekord 2A-Z-OKO TICN	Flutes	Rekord 2B-STEEL	Flutes	
7/16	20	3.937	0.866	—	0.323	0.242	0.3898	.5046	●	4	●	4	●	4	●	4	●	3
1/2	20	3.937	0.866	—	0.367	0.275	0.4528	.5047	●	4	●	4	●	4	●	4	●	3
9/16	18	3.937	0.866	—	0.429	0.322	0.5118	.5048			●	4					●	3
5/8	18	3.937	0.866	—	0.480	0.360	0.5709	.5049			●	4	●	4			●	3
3/4	16	4.331	0.984	—	0.590	0.442	0.6890	.5050	●	4	●	4	●	4			●	4
7/8	14	4.921	1.024	—	0.697	0.523	0.8071	.5051									●	4
1	12	5.512	1.102	—	0.800	0.600	0.9219	.5052									●	4
1 1/8	12	5.906	1.181	—	0.896	0.672	1.0433	.5053									●	4
1 1/4	12	5.906	1.181	—	1.021	0.766	1.1719	.5054									●	4
1 3/8	12	6.693	1.299	—	1.108	0.831	1.2992	.5055									●	4
1 1/2	12	6.693	1.299	—	1.233	0.925	1.4173	.5056									●	4

								
<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	<b>VA</b> Stainless steel materials	<b>VA</b> Stainless steel materials	<b>VA</b> Stainless steel materials	<b>Z</b> CNC-controlled machines	
<b>3B</b>	<b>3B</b> CRN	2B TIN	<b>3B</b> TIN	2B NT	<b>3B</b> NT	2B TICN	2BX TIN	Class of Fit Coating Technical Characteristics
B / 4-5 E / 0	B / 4-5 E / 0	B / 4-5 E / 0	B / 4-5 E / 0	B / 4-5 E / 0 / P	B / 4-5 E / 0 / P	B / 4-5 E / 0	B / 4-5 E / 0 / P	

max. 3 x d<sub>1</sub>



Thread Depth and Hole Shape

<b>P 1.1-2.1</b> <b>N 2.2</b>	<b>P 1.1-4.1</b> <b>N 1.4-5</b> <b>N 2.2, 2.4-5</b>	<b>P 1.1-4.1</b> <b>M 1.1-3.1</b> <b>K 2.1-2.2</b> <b>N 1.4-5</b> <b>N 2.2, 2.4-5</b>	<b>P 1.1-4.1</b> <b>M 1.1-3.1</b> <b>K 2.1-2.2</b> <b>N 1.4-5</b> <b>N 2.2, 2.4-5</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1</b> <b>K 2.1</b> <b>N 1.5, 2.4-5</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1</b> <b>K 2.1</b> <b>N 1.5, 2.4-5</b>	<b>P 1.1-4.1</b> <b>M 1.1-3.1</b> <b>K 2.1-2.2</b> <b>N 1.4-5</b> <b>N 2.2, 2.4-5</b>	<b>P 1.1-5.1</b> <b>M 1.1-3.1</b> <b>K 2.1</b> <b>N 1.4-2.2</b> <b>S 1.1</b>	Range of Application
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BU201010		BU201710		BU201400		BU201410		BU203000		BU203010		BU089300		BU203701		Tool Identification		
Rekord 1B-STEEL	Flutes	Rekord 1B-STEEL CRN	Flutes	Rekord 1B-STEEL TIN	Flutes	Rekord 1B-STEEL TIN	Flutes	Rekord 1B-VA	Flutes	Rekord 1B-VA	Flutes	Rekord 1B-VA-1KZn TICN	Flutes	Rekord 1B-Z TIN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
●				●	2			●	2	●	2					.5033	No. 0	80
				●	2			●	2	●	2					.5034	No. 1	72
				●	2			●	2	●	2					.5035	No. 2	64
				●	2			●	2	●	2					.5036	No. 3	56
●	2			●	2			●	2	●	2					.5037	No. 4	48
●	3			●	3			●	3	●	3					.5038	No. 5	44
●	3			●	3			●	3	●	3					.5039	No. 6	40
●	3			●	3			●	3	●	3					.5040	No. 8	36
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5041	No. 10	32
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5042	No. 12	28
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5043	1/4	28
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5044	5/16	24
●	4	●	4	●	4	●	4	●	4	●	4	●	4	●	4	.5045	3/8	24

CU201010		CU201710		CU201400		CU201410		CU203000		CU203010		CU089300		CU203701		Tool Identification		
Rekord 2B-STEEL	Flutes	Rekord 2B-STEEL CRN	Flutes	Rekord 2B-STEEL TIN	Flutes	Rekord 2B-STEEL TIN	Flutes	Rekord 2B-VA	Flutes	Rekord 2B-VA	Flutes	Rekord 2B-VA-1KZn TICN	Flutes	Rekord 2B-Z TIN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	4	.5046	7/16	20
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	4	.5047	1/2	20
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	4	.5048	9/16	18
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	4	.5049	5/8	18
●	4	●	4	●	4	●	4	●	4	●	4	●	4	●	4	.5050	3/4	16
				●	4			●	4	●	4					.5051	7/8	14
				●	4			●	4	●	4					.5052	1	12
				●	4			●	4	●	4					.5053	1 1/8	12
				●	4			●	4	●	4					.5054	1 1/4	12
				●	4			●	4	●	4					.5055	1 3/8	12
				●	4			●	4	●	4					.5056	1 1/2	12

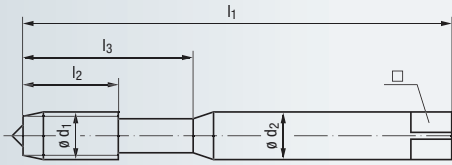
- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- MF
- NPSM/NPSC
- NPSF
- R<sub>p</sub> (BSPP)
- G
- PT
- NPTF
- R<sub>c</sub> (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



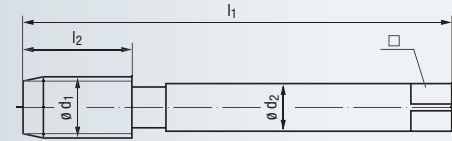
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- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

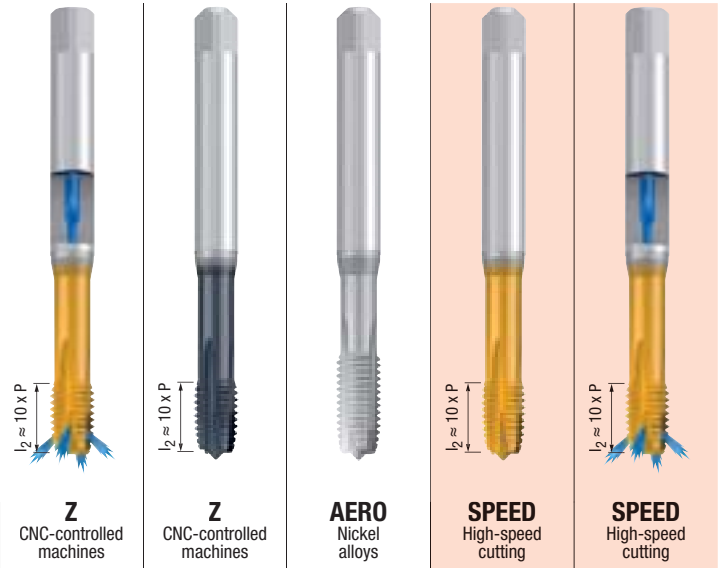
Overall length acc. to DIN 371, DIN 374



Reinforced Shank  
(No. 0 - 3/a)

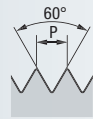


Reduced Shank  
(7/16 - 1 1/2)



Class of Fit	2BX	2BX	<b>3BX</b>	2BX	2BX
Coating	TIN	GLT-1	NT	TIN	TIN
Technical Characteristics	B / 4-5	B / 4-5	B / approx. 3	B / 4-5	B / 4-5
Thread Depth and Hole Shape	E / O	E / O / P	O / P	E / O	E / O
Range of Application	P 1.1-5.1 M 1.1-3.1 K 2.1 N 1.4-2.2 S 1.1	P 1.1-5.1 M 1.1-3.1 K 2.1 N 1.4-2.2 S 1.1	M 4.1 N 2.8 S 2.3, 2.5-6	P 1.1-4.1 M 1.1-3.1 K 2.1-2 N 1.1-2.2	P 1.1-4.1 M 1.1-3.1 K 2.1-2 N 1.1-2.2

# UNF



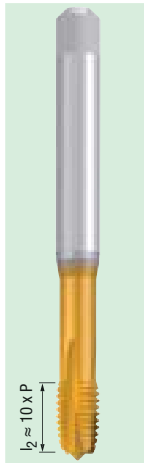
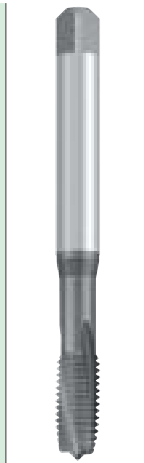
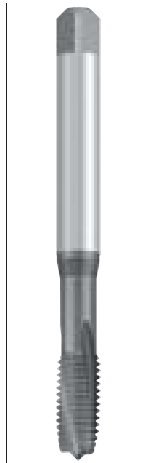
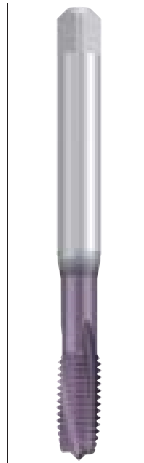
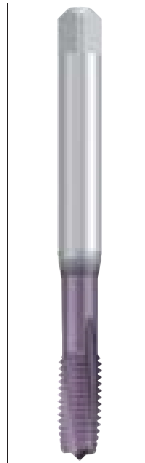
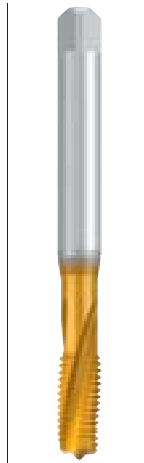
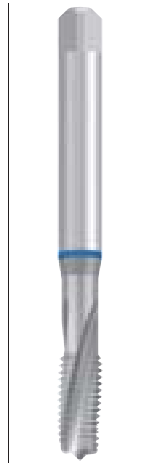
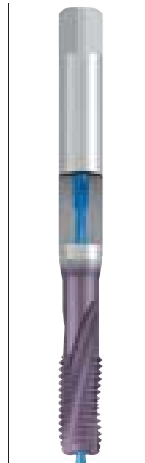

Unified fine thread  
ASME B1.1

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	inch ø d <sub>2</sub>	□	Tool Identification		BU083701		BU20C401		BU206511		BW133701		BW203701	
							Rekord 1B-Z- IKZN TIN	Flutes	Rekord 1B-Z GLT-1	Flutes	Rekord 1B-AERO	Flutes	Rekord 1B-SPEED TIN	Flutes	Rekord 1B-SPEED IKZN-TIN	Flutes		
No. 0	80	1.626	0.236	0.433	0.141	0.110	0.0480	.5033										
No. 1	72	1.772	0.276	0.472	0.141	0.110	0.0595	.5034										
No. 2	64	1.772	0.276	0.472	0.141	0.110	0.0730	.5035										
No. 3	56	1.969	0.354	0.551	0.141	0.110	0.0827	.5036										
No. 4	48	2.205	0.433	0.709	0.141	0.110	0.0945	.5037										
No. 5	44	2.205	0.433	0.709	0.141	0.110	0.1063	.5038										
No. 6	40	2.205	0.472	0.787	0.141	0.110	0.1181	.5039										
No. 8	36	2.480	0.512	0.827	0.168	0.131	0.1378	.5040					●	3				
No.10	32	2.756	0.512	0.984	0.194	0.152	0.1614	.5041	●	3	●	3	●	3	●	3	●	3
No.12	28	3.150	0.630	1.142	0.220	0.165	0.1820	.5042					●	3				
1/4	28	3.150	0.669	1.181	0.255	0.191	0.2165	.5043	●	3	●	3	●	3	●	3	●	3
5/16	24	3.543	0.669	1.260	0.318	0.238	0.2717	.5044	●	4	●	4	●	3	●	4	●	4
3/8	24	3.937	0.709	1.535	0.381	0.286	0.3346	.5045	●	4	●	4	●	4	●	4	●	4

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	inch ø d <sub>2</sub>	□	Tool Identification		CU083701		CU20C401		CU206511		CW133701		CW203701	
							Rekord 2B-Z- IKZN TIN	Flutes	Rekord 2B-Z GLT-1	Flutes	Rekord 2B-AERO	Flutes	Rekord 2B-SPEED TIN	Flutes	Rekord 2B-SPEED IKZN-TIN	Flutes		
7/16	20	3.937	0.866	—	0.323	0.242	0.3898	.5046	●	4	●	4	●	3	●	4	●	4
1/2	20	3.937	0.866	—	0.367	0.275	0.4528	.5047	●	4	●	4	●	3	●	4	●	4
9/16	18	3.937	0.866	—	0.429	0.322	0.5118	.5048	●	4								
5/8	18	3.937	0.866	—	0.480	0.360	0.5709	.5049	●	4	●	4	●	3	●	4	●	4
3/4	16	4.331	0.984	—	0.590	0.442	0.6890	.5050	●	4	●	4	●	4	●	4	●	4
7/8	14	4.921	1.024	—	0.697	0.523	0.8071	.5051										
1	12	5.512	1.102	—	0.800	0.600	0.9219	.5052										
1 1/8	12	5.906	1.181	—	0.896	0.672	1.0433	.5053										
1 1/4	12	5.906	1.181	—	1.021	0.766	1.1719	.5054										
1 3/8	12	6.693	1.299	—	1.108	0.831	1.2992	.5055										
1 1/2	12	6.693	1.299	—	1.233	0.925	1.4173	.5056										

								
<b>Z-OKO</b> Dry machining and MQL	<b>TI</b> Titanium	<b>TI</b> Titanium	<b>TI</b> Titanium	<b>NI</b> Nickel alloys	<b>STEEL</b> Steel materials	<b>VA</b> Stainless steel materials	<b>VA</b> Stainless steel materials	
2BX	2BX	<b>3BX</b>	<b>3BX</b>	<b>3BX</b>	2B	2B	2B	Class of Fit Coating Technical Characteristics 
TIN	NT2	NT2	TICN	TICN	TIN		TICN	
	L15	L15	L15	L08	R15		R15	
B / 4-5	D / 4-5	D / 4-5	D / 4-5	D / 4-5	C / 2-3		C / 2-3	
E / M / A	E / O / P	E / O / P	E / O / P	O / P	E / O		E / O	

max. 3 x d<sub>1</sub>



max. 2 x d<sub>1</sub>



Thread Depth  
and Hole Shape

<b>P 1.1-5.1</b>	<b>P 4.1-5.1</b>	<b>P 4.1-5.1</b>	<b>P 4.1-5.1</b>	<b>M 4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-4.1</b>	Range of Application
<b>M 1.1-3.1</b>	<b>M 3.1-4.1</b>	<b>M 3.1-4.1</b>	<b>M 3.1-4.1</b>	<b>N 2.8</b>	<b>M 1.1-3.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-3.1</b>	
<b>K 2.1</b>	<b>K 2.2</b>	<b>K 2.2</b>	<b>K 2.2</b>	<b>S 2.3, 2.5-6</b>	<b>K 1.1-4.2</b>	<b>K 2.1</b>	<b>K 1.1-4.2</b>	
<b>N 1.4-5</b>	<b>N 2.4-5, 2.7</b>	<b>N 2.4-5, 2.7</b>	<b>N 2.4-5, 2.7</b>		<b>N 1.4-5, 2.4-5</b>	<b>N 2.4-5</b>	<b>N 1.4-5, 2.4-5</b>	
<b>N 2.1-2, 2.4-5</b>	<b>S 1.1-2.2, 2.4</b>	<b>S 1.1-2.2, 2.4</b>	<b>S 1.1-2.2, 2.4</b>					

BW213701		BU306001		BU306011		BU309611		BU30J411		BU451400		BU453000		BU979300		Tool Identification		
Rekord 1B-Z-OKO TIN	Flutes	Rekord 1C-TI	Flutes	Rekord 1C-TI	Flutes	Rekord 1C-TI TICN	Flutes	Rekord 1C-NI TICN	Flutes	Rekord 1D-STEEL TIN	Flutes	Rekord 1D-VA	Flutes	Rekord 1D-VA- IKZ TICN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
		●	2	●	2					●	2	●	2			.5033	No. 0	80
		●	2	●	2					●	2	●	2			.5034	No. 1	72
		●	2	●	2					●	2	●	2			.5035	No. 2	64
		●	2	●	2					●	2	●	2			.5036	No. 3	56
		●	2	●	2					●	2	●	2			.5037	No. 4	48
		●	2	●	2					●	2	●	2			.5038	No. 5	44
		●	3	●	3					●	3	●	3			.5039	No. 6	40
		●	3	●	3					●	3	●	3			.5040	No. 8	36
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5041	No. 10	32
		●	3	●	3					●	3	●	3			.5042	No. 12	28
●	3	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5043	1/4	28
●	4	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5044	5/16	24
●	4	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5045	3/8	24

CW213701		CU306001		CU306011		CU309611		CU30J411		CU451400		CU453000		CU979300		Tool Identification		
Rekord 2B-Z-OKO TIN	Flutes	Rekord 2C-TI	Flutes	Rekord 2C-TI	Flutes	Rekord 2C-TI TICN	Flutes	Rekord 2C-NI TICN	Flutes	Rekord 2D-STEEL TIN	Flutes	Rekord 2D-VA	Flutes	Rekord 2D-VA- IKZ TICN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
●	4	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5046	7/16	20
●	4	●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5047	1/2	20
		●	3	●	3	●	3	●	3	●	3	●	3			.5048	9/16	18
		●	3	●	3	●	3	●	3	●	3	●	3			.5049	5/8	18
		●	4	●	4	●	4	●	4	●	4	●	4			.5050	3/4	16
		●	4	●	4					●	4	●	4			.5051	7/8	14
				●	4					●	4	●	4			.5052	1	12
																.5053	1 1/8	12
																.5054	1 1/4	12
																.5055	1 3/8	12
																.5056	1 1/2	12

Product Finder

v<sub>c</sub>

UNC

UNF

UNEF

UN-8

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

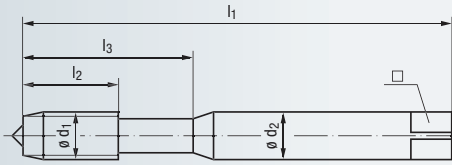
Tech. Info



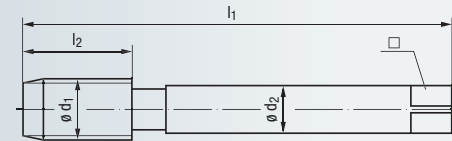
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

Overall length acc. to DIN 371, DIN 374



Reinforced Shank  
(No. 0 - 3/8)



Reduced Shank  
(7/16 - 1 1/2)



**TI** Titanium     
 **TI** Titanium     
 **TI** Titanium     
 **NI** Nickel alloys     
 **Z** CNC-controlled machines

# UNF

**Unified fine thread  
ASME B1.1**

Class of Fit  
Coating  
Technical Characteristics  
Thread Depth and Hole Shape

2BX	<b>3BX</b>	<b>3BX</b>	<b>3BX</b>	2BX
NT2	NT2	TICN	TICN	TIN
R15	R15	R15	R10	R15
C/2-3	C/2-3	C/2-3	C/2-3	C/2-3
E/O/P	E/O/P	E/O/P	O/P	E/O/P

Range of Application




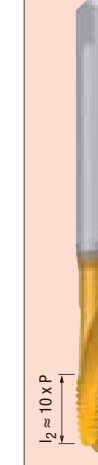
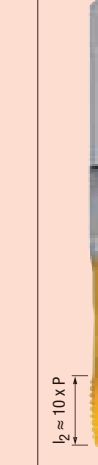




<b>P 4.1-5.1</b>	<b>P 4.1-5.1</b>	<b>P 4.1-5.1</b>	<b>N 2.8</b>	<b>P 1.1-5.1</b>
<b>M 3.1-4.1</b>	<b>M 3.1-4.1</b>	<b>M 3.1-4.1</b>	<b>S 2.3, 2.5-6</b>	<b>M 1.1-3.1</b>
<b>K 2.2</b>	<b>K 2.2</b>	<b>K 2.2</b>		<b>K 2.1-2</b>
<b>N 2.4-5, 2.7</b>	<b>N 2.4-5, 2.7</b>	<b>N 2.4-5, 2.7</b>		<b>N 1.4-6, 2.4-5</b>
<b>S 1.1-2.2, 2.4</b>	<b>S 1.1-2.2, 2.4</b>	<b>S 1.1-2.2, 2.4</b>		

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	inch ø d <sub>2</sub>	□	Tool Identification		BU456001		BU456011		BU459611		BU35J411		BU453701	
							Rekord 1D-TI	Flutes	Rekord 1D-TI	Flutes	Rekord 1D-TI TICN	Flutes	Rekord 1DF-NI TICN	Flutes	Rekord 1D-Z TIN	Flutes		
No. 0	80	1.626	0.236	0.433	0.141	0.110	0.0480	.5033	●	2	●	2						
No. 1	72	1.772	0.276	0.472	0.141	0.110	0.0595	.5034	●	2	●	2						
No. 2	64	1.772	0.276	0.472	0.141	0.110	0.0730	.5035			●	2						
No. 3	56	1.969	0.354	0.551	0.141	0.110	0.0827	.5036			●	2						
No. 4	48	2.205	0.433	0.709	0.141	0.110	0.0945	.5037			●	2						
No. 5	44	2.205	0.433	0.709	0.141	0.110	0.1063	.5038			●	2						
No. 6	40	2.205	0.472	0.787	0.141	0.110	0.1181	.5039			●	3						
No. 8	36	2.480	0.512	0.827	0.168	0.131	0.1378	.5040	●	3	●	3						
No.10	32	2.756	0.512	0.984	0.194	0.152	0.1614	.5041	●	3	●	3	●	3	●	3	●	3
No.12	28	3.150	0.630	1.142	0.220	0.165	0.1820	.5042			●	3						
1/4	28	3.150	0.669	1.181	0.255	0.191	0.2165	.5043	●	3	●	3	●	3	●	3	●	3
5/16	24	3.543	0.669	1.260	0.318	0.238	0.2717	.5044	●	3	●	3	●	3	●	3	●	3
3/8	24	3.937	0.709	1.535	0.381	0.286	0.3346	.5045	●	3	●	3	●	3	●	3	●	3

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	inch ø d <sub>2</sub>	□	Tool Identification		CU456001		CU456011		CU459611		CU35J411		CU453701	
							Rekord 2D-TI	Flutes	Rekord 2D-TI	Flutes	Rekord 2D-TI TICN	Flutes	Rekord 2DF-NI TICN	Flutes	Rekord 2D-Z TIN	Flutes		
7/16	20	3.937	0.866	—	0.323	0.242	0.3898	.5046	●	3	●	3	●	3	●	3	●	3
1/2	20	3.937	0.866	—	0.367	0.275	0.4528	.5047	●	3	●	3	●	3	●	3	●	3
9/16	18	3.937	0.866	—	0.429	0.322	0.5118	.5048	●	3	●	3	●	3	●	3	●	3
5/8	18	3.937	0.866	—	0.480	0.360	0.5709	.5049	●	3	●	3	●	3	●	3	●	3
3/4	16	4.331	0.984	—	0.590	0.442	0.6890	.5050	●	4	●	4	●	4	●	4	●	4
7/8	14	4.921	1.024	—	0.697	0.523	0.8071	.5051	●	4	●	4						
1	12	5.512	1.102	—	0.800	0.600	0.9219	.5052	●	4	●	4						
1 1/8	12	5.906	1.181	—	0.896	0.672	1.0433	.5053	●	4	●	4						
1 1/4	12	5.906	1.181	—	1.021	0.766	1.1719	.5054	●	4	●	4						
1 3/8	12	6.693	1.299	—	1.108	0.831	1.2992	.5055	●	5	●	5						
1 1/2	12	6.693	1.299	—	1.233	0.925	1.4173	.5056	●	5	●	5						

							
Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	SPEED High-speed cutting	SPEED High-speed cutting	STEEL Steel materials	STEEL Steel materials	
2BX	2BX	2BX	2BX	2BX	2B	<b>3B</b>	Class of Fit
TIN	TIN	TIN	TIN	TIN	R35	R35	Coating
R15	<b>BF</b> R15	<b>BF</b> R15	R15	R15	C/2-3	C/2-3	Technical Characteristics
C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	E/O	E/O	
E/O	E/O/P	E/O	E/O	E/O	E/O	E/O	

max. 2 x d<sub>1</sub>



max. 2.5 x d<sub>1</sub>



Thread Depth and Hole Shape

<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-2.1</b>	<b>P 1.1-2.1</b>	Range of Application
<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>N 2.2</b>	<b>N 2.2</b>	
<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>			
<b>N 1.4-6,2,4-5</b>	<b>N 1.4-6,2,4-5</b>	<b>N 1.4-6,2,4-5</b>	<b>N 1.4-2.1</b>	<b>N 1.4-2.1</b>			

BU973701		BU523701		BU573701		BU263701		BU293701		BU501000		BU501010		Tool Identification		
Rekord 1D-Z-IKZ TIN	Flutes	Rekord 1D-Z-BF TIN	Flutes	Rekord 1D-Z-BF IKZ-TIN	Flutes	Rekord 1D-SPEED TIN	Flutes	Rekord 1D-SPEED IKZ-TIN	Flutes	Enorm 1-STEEL	Flutes	Enorm 1-STEEL	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
●	3	●	3	●	3	●	3	●	3	●	2	●	2	.5033	No. 0	80
										●	2			.5034	No. 1	72
										●	2			.5035	No. 2	64
										●	2			.5036	No. 3	56
										●	2	●	2	.5037	No. 4	48
										●	3	●	3	.5038	No. 5	44
										●	3	●	3	.5039	No. 6	40
										●	3	●	3	.5040	No. 8	36
										●	3	●	3	.5041	No. 10	32
										●	3	●	3	.5042	No. 12	28
										●	3	●	3	.5043	1/4	28
										●	3	●	3	.5044	5/16	24
										●	3	●	3	.5045	3/8	24

CU973701		CU573701		CU583701		CU263701		CU293701		CU501000		CU501010		Tool Identification		
Rekord 2D-Z-IKZ TIN	Flutes	Rekord 2D-Z-BF TIN	Flutes	Rekord 2D-Z-BF IKZ-TIN	Flutes	Rekord 2D-SPEED TIN	Flutes	Rekord 2D-SPEED IKZ-TIN	Flutes	Enorm 2-STEEL	Flutes	Enorm 2-STEEL	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5046	7/16	20
●	3	●	3	●	3	●	3	●	3	●	4	●	4	.5047	1/2	20
●	3	●	3	●	3	●	3	●	3	●	4	●	4	.5048	9/16	18
●	3	●	3	●	3	●	3	●	3	●	4	●	4	.5049	5/8	18
●	4	●	4	●	4	●	4	●	4	●	4	●	4	.5050	3/4	16
										●	4			.5051	7/8	14
										●	4			.5052	1	12
										●	4			.5053	1 1/8	12
										●	5			.5054	1 1/4	12
										●	5			.5055	1 3/8	12
										●	6			.5056	1 1/2	12

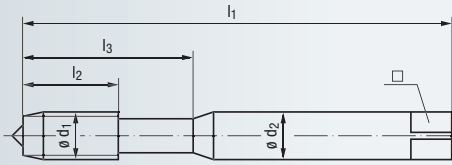
- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



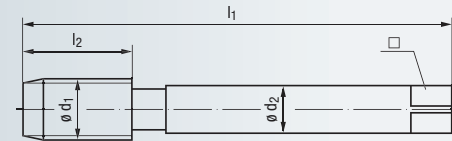
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

Overall length acc. to DIN 371, DIN 374



Reinforced Shank  
(No.0 - 3/8)



Reduced Shank  
(7/16 - 1 1/2)



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



**Z**  
CNC-controlled machines



**Z**  
CNC-controlled machines



**Z**  
CNC-controlled machines



**Unified fine thread  
ASME B1.1**

Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application

2B	<b>3B</b>	2B	2B	<b>3B</b>
NE2	NE2			
R35	R35	R45	R45	R45
C / 2-3	C / 2-3	C / 2-3	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>
E / O / P	E / O / P	E / O / P	E / O / P	E / O / P

max. 2.5 x d<sub>1</sub>



max. 3 x d<sub>1</sub>



<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>
<b>K 2.1</b>	<b>K 2.1</b>	<b>N 2.1</b>	<b>N 2.1</b>	<b>N 2.1</b>

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	inch ø d <sub>2</sub>	□	Tool Identification		BU503200		BU503210		BU513500		BU513510	
							Image	Dimens. ID	Enorm 1-VA NE2	Flutes	Enorm 1-VA NE2	Flutes	Enorm 1-Z/E	Flutes	Enorm 1-Z/E	Flutes
No. 0	80	1.626	0.157	0.433	0.141	0.110	0.0480	<b>.5033</b>	●	2	●	2	●	2		
No. 1	72	1.772	0.157	0.472	0.141	0.110	0.0595	<b>.5034</b>	●	2	●	2	●	2		
No. 2	64	1.772	0.177	0.472	0.141	0.110	0.0730	<b>.5035</b>	●	2	●	2	●	2		
No. 3	56	1.969	0.197	0.551	0.141	0.110	0.0827	<b>.5036</b>	●	2	●	2	●	2		
No. 4	48	2.205	0.236	0.709	0.141	0.110	0.0945	<b>.5037</b>	●	2	●	2	●	2		
No. 5	44	2.205	0.276	0.709	0.141	0.110	0.1063	<b>.5038</b>	●	3	●	3	●	3		
No. 6	40	2.205	0.276	0.787	0.141	0.110	0.1181	<b>.5039</b>	●	3	●	3	●	3		
No. 8	36	2.480	0.315	0.827	0.168	0.131	0.1378	<b>.5040</b>	●	3	●	3	●	3		
No.10	32	2.756	0.394	0.984	0.194	0.152	0.1614	<b>.5041</b>	●	3	●	3	●	3	●	3
No.12	28	3.150	0.394	1.142	0.220	0.165	0.1820	<b>.5042</b>	●	3	●	3	●	3		
1/4	28	3.150	0.394	1.181	0.255	0.191	0.2165	<b>.5043</b>	●	3	●	3	●	3	●	3
5/16	24	3.543	0.394	1.260	0.318	0.238	0.2717	<b>.5044</b>	●	3	●	3	●	3	●	3
3/8	24	3.937	0.394	1.535	0.381	0.286	0.3346	<b>.5045</b>	●	3	●	3	●	3	●	3

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	inch ø d <sub>2</sub>	□	Tool Identification		CU503200		CU503210		CU503500		CU513500		CU513510	
							Image	Dimens. ID	Enorm 2-VA NE2	Flutes	Enorm 2-VA NE2	Flutes	Enorm 2-Z	Flutes	Enorm 2-Z/E	Flutes	Enorm 2-Z/E	Flutes
7/16	20	3.937	0.512	—	0.323	0.242	0.3898	<b>.5046</b>	●	3	●	3			●	4	●	4
1/2	20	3.937	0.512	—	0.367	0.275	0.4528	<b>.5047</b>	●	4	●	4			●	5	●	5
9/16	18	3.937	0.591	—	0.429	0.322	0.5118	<b>.5048</b>	●	4	●	4			●	5	●	5
5/8	18	3.937	0.591	—	0.480	0.360	0.5709	<b>.5049</b>	●	4	●	4			●	5	●	5
3/4	16	4.331	0.669	—	0.590	0.442	0.6890	<b>.5050</b>	●	4	●	4			●	5	●	5
7/8	14	4.921	0.669	—	0.697	0.523	0.8071	<b>.5051</b>	●	4	●	4			●	5		
1	12	5.512	0.787	—	0.800	0.600	0.9219	<b>.5052</b>	●	4	●	4			●	5		
1 1/8	12	5.906	0.866	—	0.896	0.672	1.0433	<b>.5053</b>	●	4	●	4	●	5				
1 1/4	12	5.906	0.866	—	1.021	0.766	1.1719	<b>.5054</b>	●	5	●	5	●	6				
1 3/8	12	6.693	0.945	—	1.108	0.831	1.2992	<b>.5055</b>	●	5	●	5	●	6				
1 1/2	12	6.693	0.984	—	1.233	0.925	1.4173	<b>.5056</b>	●	6	●	6	●	6				



									<p><b>SPEED</b> High-speed cutting</p>	<p>Class of Fit</p> <p>Coating</p> <p>Technical Characteristics</p>
Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines		
2B	2B	2B	2B	2B	2B	2B	2B	2B		
TIN	TIN	TICN	TICN	GLT-1	GLT-1	GLT-1	TIN	TIN		
R45	R45	R45	R45	R45	R45	R45	R45	R45		
C / 2-3	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>	C / 2-3	<b>E / 1.5-2</b>	C / 2-3	C / 2-3	C / 2-3		
E / O / P	E / O / P	E / O / P	E / O	E	E	E	E / O	E / O		

max. 3 x d<sub>1</sub>



Thread Depth and Hole Shape

<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<p>Range of Application</p>
<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	
<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>	
<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	
<b>S 1.1</b>	<b>S 1.1</b>	<b>S 1.1</b>	<b>S 1.1</b>	<b>S 1.1</b>	<b>S 1.1</b>	<b>S 1.1</b>	<b>S 1.1</b>	

BU513700		BU519400		BU999400		BU50C400		BU51C400		BU94C400		BW553700		Tool Identification		
Enorm 1-Z/E TIN	Flutes	Enorm 1-Z/E TICN	Flutes	Enorm 1-Z/E-IKZ TICN	Flutes	Enorm 1-Z GLT-1	Flutes	Enorm 1-Z/E GLT-1	Flutes	Enorm 1-Z-IKZ GLT-1	Flutes	Enorm 1-SPEED IKZ-TIN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
●	2													.5033	No. 0	80
●	2													.5034	No. 1	72
●	2													.5035	No. 2	64
●	2													.5036	No. 3	56
●	2													.5037	No. 4	48
●	3													.5038	No. 5	44
●	3													.5039	No. 6	40
●	3													.5040	No. 8	36
●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5041	No. 10	32
●	3													.5042	No. 12	28
●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5043	1/4	28
●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5044	5/16	24
●	3	●	3	●	3	●	3	●	3	●	3	●	3	.5045	3/8	24

CU503700		CU513700		CU519400		CU999400		CU50C400		CU51C400		CU94C400		CW553700		Tool Identification		
Enorm 2-Z TIN	Flutes	Enorm 2-Z/E TIN	Flutes	Enorm 2-Z/E TICN	Flutes	Enorm 2-Z/E-IKZ TICN	Flutes	Enorm 2-Z GLT-1	Flutes	Enorm 2-Z/E GLT-1	Flutes	Enorm 2-Z-IKZ GLT-1	Flutes	Enorm 2-SPEED IKZ-TIN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.
●		●	4	●	4	●	4	●	4	●	4	●	4	●	4	.5046	7/16	20
		●	5	●	5	●	5	●	5	●	5	●	5	●	5	.5047	1/2	20
		●	5	●	5			●	5	●	5	●	5	●	5	.5048	9/16	18
		●	5	●	5			●	5	●	5	●	5	●	5	.5049	5/8	18
		●	5	●	5			●	5	●	5	●	5	●	5	.5050	3/4	16
		●	5											●	5	.5051	7/8	14
		●	5											●	5	.5052	1	12
●	5															.5053	1 1/8	12
●	6															.5054	1 1/4	12
●	6															.5055	1 3/8	12
●	6															.5056	1 1/2	12

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- MF
- NPSM/NPSC
- NPSF
- R<sub>p</sub> (BSPP)
- G
- PT
- NPTF
- R<sub>c</sub> (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

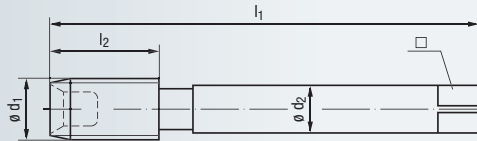


- Product Finder
- Vc
- UNC
- UNF**
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

Overall length acc. to DIN 374

With internal chip collector



Reduced Shank

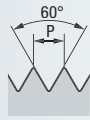


**VA**  
Stainless steel materials



**VA**  
Stainless steel materials

## UNF



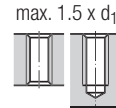
Unified fine thread  
ASME B1.1

Class of Fit  
Coating  
Technical Characteristics



2BX	<b>3BX</b>
NE2	NE2
C / 2-3	C / 2-3
P / O 1)	P / O 1)

Thread Depth and Hole Shape



Range of Application

<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>
<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>

### Reduced Shank

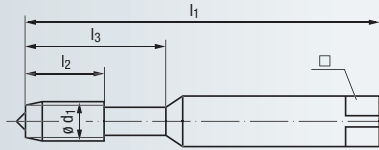
Reduced Shank							Tool Identification		CU803001		CU803011	
Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch		□		Dimens. ID	Robust 2X-VA	Flutes	Robust 2X-VA	Flutes
				ø d <sub>2</sub>	□							
3/4	16	4.331	0.984	0.590	0.442		0.6890	<b>.5050</b>	●	5		
7/8	14	4.921	1.024	0.697	0.523		0.8071	<b>.5051</b>	●	5	upon	
1	12	5.512	1.102	0.800	0.600		0.9219	<b>.5052</b>	●	5	request	
1 1/8	12	5.906	1.181	0.896	0.672		1.0433	<b>.5053</b>	●	5		
1 1/4	12	5.906	1.181	1.021	0.766		1.1719	<b>.5054</b>	●	6		
1 3/8	12	6.693	1.299	1.108	0.831		1.2992	<b>.5055</b>	●	6		
1 1/2	12	6.693	1.299	1.233	0.925		1.4173	<b>.5056</b>	●	6		

1) If possible, use paste lubrication, coating both the tool and the walls of the drilled hole. Lubrication with oil is possible only in the vertical machining of blind holes, if the hole is entirely filled with oil.

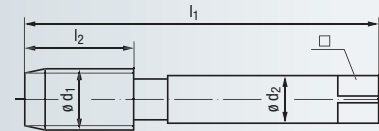
Larger sizes priced upon request. We have experience in making taps as large as 10 inches ø UN.

**The Complete Tool System**  
Robust 2X-VA Taps when used with a KSN Type tapping attachment creates the optimal tapping unit!

**ANSI Length • ANSI Shank**



Reinforced Shank  
(No.6 - 3/8)



Reduced Shank  
(7/16 - 3/4)

**UNF**

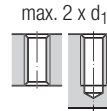


Unified fine thread  
ASME B1.1

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape



Range of Application

<b>P 2.1-4.1</b>	<b>P 2.1-5.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>
<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>	<b>M 1.1-3.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>
<b>N 2.4-7</b>	<b>N 2.4-7, 4.1</b>	<b>K 2.1-2.2</b>	<b>K 2.1</b>	<b>K 2.1</b>
<b>N 4.1, 5.1</b>		<b>N 1.4-5</b>	<b>N 1.5, 2.4-5</b>	<b>N 1.5, 2.4-5</b>
		<b>N 2.2, 2.4-5</b>		

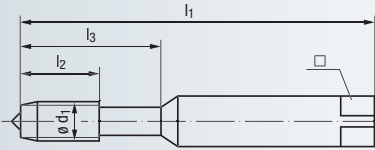
Nominal Size ø d <sub>1</sub>	T.P.I.	inch						Tool Identification		AU100501		AU109101		AU201400		AU203000		AU203010	
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	□	Dimens. ID	Rekord A-H	Flutes	Rekord A-H TICN	Flutes	Rekord B-STEEL TIN	Flutes	Rekord B-VA	Flutes	Rekord B-VA	Flutes		
No. 6	40	2	2.00	0.472	0.748	0.141	0.110	0.1181	.5039	●	3	●	3	●	3	●	3		
No. 8	36	2 1/8	2.13	0.512	0.827	0.168	0.131	0.1378	.5040	●	3	●	3	●	3	●	3		
No. 10	32	2 3/8	2.38	0.591	0.945	0.194	0.152	0.1614	.5041	●	3	●	3	●	3	●	3	●	3
1/4	28	2 1/2	2.50	0.669	1.142	0.255	0.191	0.2165	.5043	●	3	●	3	●	3	●	3	●	3
5/16	24	2 23/32	2.72	0.669	1.299	0.318	0.238	0.2717	.5044	●	3	●	3	●	3	●	3	●	3
3/8	24	2 15/16	2.94	0.709	1.378	0.381	0.286	0.3346	.5045	●	4	●	4	●	3	●	3	●	3
7/16	20	3 5/32	3.16	0.866	—	0.323	0.242	0.3898	.5046	●	4	●	4	●	3	●	3	●	3
1/2	20	3 3/8	3.38	0.866	—	0.367	0.275	0.4528	.5047	●	4	●	4	●	3	●	3	●	3
9/16	18	3 19/32	3.59	0.866	—	0.429	0.322	0.5118	.5048	●	4	●	4	●	3	●	3	●	3
5/8	18	3 13/16	3.81	0.866	—	0.480	0.360	0.5709	.5049	●	4	●	4	●	3	●	3	●	3
3/4	16	4 1/4	4.25	0.984	—	0.590	0.442	0.6890	.5050			●	4	●	4	●	4	●	4

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

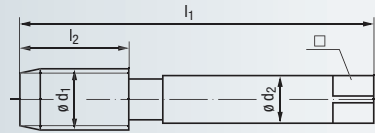


- Product Finder
- Vc
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### ANSI Length • ANSI Shank



Reinforced Shank  
(No. 6 - 3/8)



Reduced Shank  
(7/16 - 3/4)



**VA**  
Stainless steel materials



**TI**  
Titanium



**TI**  
Titanium



**TI**  
Titanium



**TI**  
Titanium



### UNF Unified fine thread ASME B1.1

Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application

<b>OverSize</b>	2BX	<b>3BX</b>	2BX	<b>3BX</b>
NT	NT2	NT2	NT2	NT2
L15	L15	L15	R15	R15
B / 4-5	D / 4-5	D / 4-5	C / 2-3	C / 2-3
E / O / P	E / O / P	E / O / P	E / O / P	E / O / P

max. 3 x d<sub>1</sub>



max. 2 x d<sub>1</sub>



<b>P 1.1-3.1</b>	<b>P 4.1-5.1</b>	<b>P 4.1-5.1</b>	<b>P 4.1-5.1</b>	<b>P 4.1-5.1</b>
<b>M 1.1-2.1</b>	<b>M 3.1-4.1</b>	<b>M 3.1-4.1</b>	<b>M 3.1-4.1</b>	<b>M 3.1-4.1</b>
<b>K 2.1</b>	<b>K 2.2</b>	<b>K 2.2</b>	<b>K 2.2</b>	<b>K 2.2</b>
<b>N 1.5, 2.4-5</b>	<b>N 2.4-5, 2.7</b>	<b>N 2.4-5, 2.7</b>	<b>N 2.4-5, 2.7</b>	<b>N 2.4-5, 2.7</b>
	<b>S 1.1-2.2, 2.4</b>	<b>S 1.1-2.2, 2.4</b>	<b>S 1.1-2.2, 2.4</b>	<b>S 1.1-2.2, 2.4</b>

Nominal Size ø d <sub>1</sub>	T.P.I.	inch							Tool Identification	AU203044		AU306001		AU306011		AU456001		AU456011	
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	□	Rekord B-VA	Flutes		Rekord C-TI	Flutes	Rekord C-TI	Flutes	Rekord D-TI	Flutes	Rekord D-TI	Flutes		
No. 6	40	2	2.00	0.472	0.748	0.141	0.110	0.1181	<b>.5039</b>										
No. 8	36	2 1/8	2.13	0.512	0.827	0.168	0.131	0.1378	<b>.5040</b>										
No. 10	32	2 3/8	2.38	0.591	0.945	0.194	0.152	0.1614	<b>.5041</b>	1) ● (+.0035)	3	●	3	●	3	●	3	●	3
1/4	28	2 1/2	2.50	0.669	1.142	0.255	0.191	0.2165	<b>.5043</b>	● (+.0050)	3	●	3	●	3	●	3	●	3
5/16	24	2 23/32	2.72	0.669	1.299	0.318	0.238	0.2717	<b>.5044</b>	● (+.0050)	3	●	3	●	3	●	3	●	3
3/8	24	2 15/16	2.94	0.709	1.378	0.381	0.286	0.3346	<b>.5045</b>	● (+.0050)	3	●	3	●	3	●	3	●	3
7/16	20	3 5/32	3.16	0.866	—	0.323	0.242	0.3898	<b>.5046</b>	● (+.0050)	3	●	3	●	3	●	3	●	3
1/2	20	3 3/8	3.38	0.866	—	0.367	0.275	0.4528	<b>.5047</b>	● (+.0050)	3	●	3	●	3	●	3	●	3
9/16	18	3 19/32	3.59	0.866	—	0.429	0.322	0.5118	<b>.5048</b>			●	3	●	3	●	3	●	3
5/8	18	3 13/16	3.81	0.866	—	0.480	0.360	0.5709	<b>.5049</b>	● (+.0050)	3	●	3	●	3	●	3	●	3
3/4	16	4 1/4	4.25	0.984	—	0.590	0.442	0.6890	<b>.5050</b>			●	4	●	4	●	4	●	4

1) Tool Identification = AU203043

VA Stainless steel materials		VA Stainless steel materials		VA Stainless steel materials		Z CNC-controlled machines		Z CNC-controlled machines		Z CNC-controlled machines		Z CNC-controlled machines					
2B		3B		Oversize		2B		3B		2B		3B		Class of Fit			
NE2		NE2		NE2		R45		R45		TIN		TIN		Coating			
R35		R35		R35		E / 1.5-2		E / 1.5-2		R45		R45		Technical Characteristics			
C / 2-3		C / 2-3		C / 2-3		E / O / P		E / O / P		E / 1.5-2		E / 1.5-2					
E / O / P		E / O / P		E / O / P		E / O / P		E / O / P		E / O / P		E / O / P		Thread Depth and Hole Shape			
max. 2.5 x d <sub>1</sub>						max. 3 x d <sub>1</sub>											
																Range of Application	
P 1.1-3.1		P 1.1-3.1		P 1.1-3.1		P 1.1-4.1		P 1.1-4.1		P 1.1-4.1		P 1.1-4.1					
M 1.1-2.1		M 1.1-2.1		M 1.1-2.1		M 1.1-2.1		M 1.1-2.1		M 1.1-3.1		M 1.1-3.1					
K 2.1		K 2.1		K 2.1		N 2.1		N 2.1		N 1.4-6		N 1.4-6					
										N 2.1-2, 2.4-5		N 2.1-2, 2.4-5					
										S 1.1		S 1.1					
AU503200		AU503210		AU503244		AU513500		AU513510		AU513700		AU513710		Tool Identification			
Enorm VA NE2	Flutes	Enorm VA NE2	Flutes	Enorm VA NE2	Flutes	Enorm Z/E	Flutes	Enorm Z/E	Flutes	Enorm Z/E TIN	Flutes	Enorm Z/E TIN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.	
●	3					●	3			●	3			.5039	No. 6	40	
●	3					●	3			●	3			.5040	No. 8	36	
●	3	●	3	2) ● (+.0035)	3	●	3	●	3	●	3	●	3	.5041	No. 10	32	
●	3	●	3	● (+.0050)	3	●	3	●	3	●	3	●	3	.5043	1/4	28	
●	3	●	3	● (+.0050)	3	●	3	●	3	●	3	●	3	.5044	5/16	24	
●	3	●	3	● (+.0050)	3	●	3	●	3	●	3	●	3	.5045	3/8	24	
●	3	●	3	● (+.0050)	3	●	4	●	4	●	4	●	4	.5046	7/16	20	
●	4	●	4	● (+.0050)	4	●	5	●	5	●	5	●	5	.5047	1/2	20	
●	4	●	4			●	5	●	5	●	5	●	5	.5048	9/16	18	
●	4	●	4	● (+.0050)	4	●	5	●	5	●	5	●	5	.5049	5/8	18	
●	4	●	4			●	5	●	5	●	5	●	5	.5050	3/4	16	

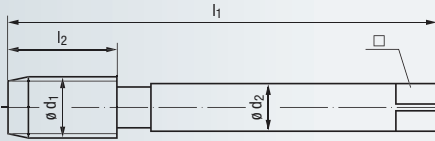
2) Tool Identification = AU503243

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



- Product Finder
- Vc
- UNC
- UNF
- UNEF**
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



Reduced Shank



**STEEL**  
Steel materials



**STEEL**  
Steel materials



**VA**  
Stainless steel materials



**STEEL**  
Steel materials



## UNEF

Unified extra fine thread  
ASME B1.1

Class of Fit  
Coating  
Technical Characteristics



Thread Depth and Hole Shape

Range of Application

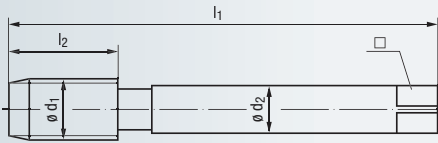
2BX	2B	2B	2B
		R15	R35
C / 2-3	B / 4-5	<b>E / 1.5-2</b>	C / 2-3
E / 0	E / 0	E / 0 / P	E / 0
max. 2 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 2 x d <sub>1</sub>	max. 2.5 x d <sub>1</sub>
<b>P 1.1-2.1</b> <b>N 2.3</b>	<b>P 1.1-2.1</b> <b>N 2.2</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1</b> <b>K 2.1</b> <b>N 2.4-5</b>	<b>P 1.1-2.1</b> <b>N 2.2</b>

### Reduced Shank

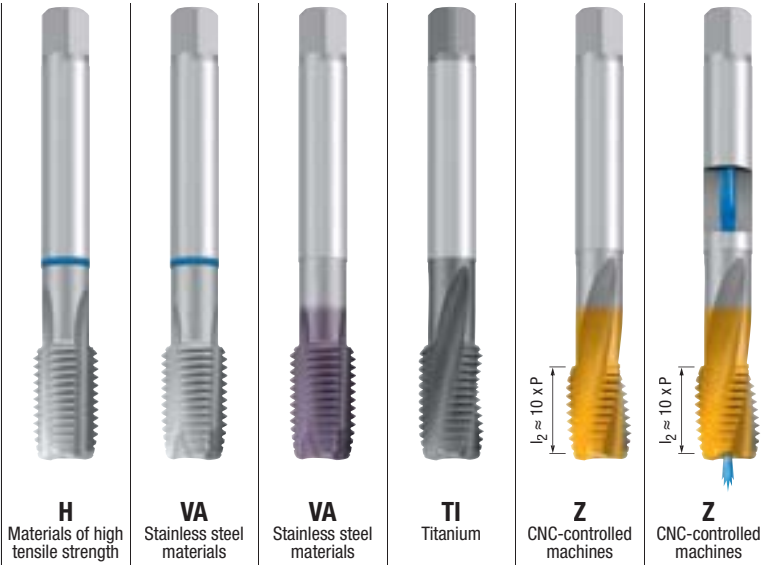
Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	mm		□	Tool Identification		C0101001		C0201000		C0463000		C0501000	
				ø d <sub>2</sub>	□		Rekord 2A-STEEL	Flutes	Rekord 2B-STEEL	Flutes	Rekord 2D-VA/E	Flutes	Enorm 2-STEEL	Flutes		
1/4	32	80	14	4.5	3.4	5.55	<b>.5058</b>	★	3	★	3	★	3	★	3	
5/16	32	80	14	6	4.9	7.15	<b>.5059</b>	★	3	★	3	★	3	★	3	
3/8	32	90	18	7	5.5	8.7	<b>.5060</b>	★	4	★	4	★	3	★	4	
7/16	28	90	18	8	6.2	10.2	<b>.5061</b>	★	4	★	4	★	3	★	3	
1/2	28	100	18	9	7	11.8	<b>.5062</b>	★	4	★	4	★	3	★	4	
9/16	24	100	18	11	9	13.2	<b>.5063</b>	★	5	★	4	★	4	★	4	
5/8	24	100	18	12	9	14.8	<b>.5064</b>	★	5	★	4	★	4	★	4	
3/4	20	110	25	14	11	17.8	<b>.5066</b>	★	4	★	4	★	4	★	4	
7/8	20	125	25	18	14.5	20.95	<b>.5068</b>	★	4	★	4	★	4	★	4	
1	20	140	28	18	14.5	24.15	<b>.5070</b>	★	4	★	4	★	4	★	5	

**DIN Length · ANSI Shank**

Overall length acc. to DIN 376



Reduced Shank



**UN-8**

Unified thread  
ASME B1.1



Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

Range of Application

2BX	2B	2B	2BX	2BX	2BX
NT	NT	TICN	NT2	TIN	TIN
C / 2-3	B / 4-5	B / 4-5	C / 2-3	BF R15	BF R15
E / O / P	E / O / P	E / O / P	E / O / P	E / O / P	E / O
max. 2 x d <sub>1</sub>	max. 3 x d <sub>1</sub>		max. 2 x d <sub>1</sub>		
P 2.1-4.1		P 1.1-3.1	P 1.1-4.1	P 4.1-5.1	P 1.1-5.1
K 1.1-4.2		M 1.1-2.1	M 1.1-3.1	M 3.1-4.1	M 1.1-3.1
N 2.4-7		K 2.1	K 2.1-2.2	K 2.2	K 2.1-2
N 4.1, 5.1		N 1.5, 2.4-5	N 1.4-5	N 2.4-5, 2.7	N 1.4-6, 2.4-5
		N 2.2, 2.4-5	S 1.1-2.2, 2.4		N 1.4-6, 2.4-5

**Reduced Shank**

Nominal Size ø d <sub>1</sub>	T.P.I.	inch				□	Tool Identification		CU100501		CU203000		CU209300		CU456001		CU573701		CU583701	
		l <sub>1</sub>	l <sub>2</sub>	ø d <sub>2</sub>			Rekord 2A-H	Flutes	Rekord 2B-VA	Flutes	Rekord 2B-VA TICN	Flutes	Rekord 2D-TI	Flutes	Rekord 2D-Z-BF TIN	Flutes	Rekord 2D-Z-BF IKZ-TIN	Flutes		
1	8	6.299	1.417	0.800	0.600	0.8750	.5018	●	4	●	3	●	3	●	3	●	3	●	3	
1 1/8	8	7.087	1.575	0.896	0.672	1.0000	.5247	●	4	●	4	●	4	●	4	●	4	●	4	
1 1/4	8	7.087	1.575	1.021	0.766	1.1250	.5249	●	4	●	4	●	4	●	4	●	4	●	4	
1 3/8	8	7.874	1.654	1.108	0.831	1.2500	.5251	●	4	●	4	●	4	●	4	●	4	●	4	
1 1/2	8	7.874	1.654	1.233	0.925	1.3750	.5253	●	4	●	4	●	4	●	4	●	4	●	4	
1 5/8	8	7.874	1.772	1.305	0.979	1.5000	.5255	●	4	●	4	●	4	●	4	●	4	●	4	
1 3/4	8	7.874	1.772	1.430	1.072	1.6250	.5257	●	5	●	4	●	4	●	4	●	5	●	5	
1 7/8	8	8.858	1.969	1.519	1.139	1.7500	.5259	●	6	●	6	●	6	●	6	●	6	●	6	
2	8	8.858	1.969	1.644	1.233	1.8750	.5261	●	6	●	6	●	6	●	6	●	6	●	6	
2 1/2	8	10.827	2.165	2.100	1.575	2.3750	.5265	●	6	●	6	●	6	●	6	●	6	●	6	

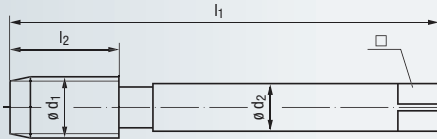
- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8**
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



- Product Finder
- Vc
- UNC
- UNF
- UNEF
- UN-8**
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

Overall length acc. to DIN 376



Reduced Shank



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



**Z**  
CNC-controlled machines



**Z**  
CNC-controlled machines



**Z**  
CNC-controlled machines

## UN-8



Unified thread  
ASME B1.1

Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application

2B	<b>3B</b>	2B	2B	2B
NE2	NE2		TiN	TiCN
R35	R35	R45	R45	R45
C/2-3	C/2-3	C/2-3	C/2-3	C/2-3
E/O/P	E/O/P	E/O/P	E/O/P	E/O/P

max. 2.5 x d<sub>1</sub>



max. 3 x d<sub>1</sub>



<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>
<b>K 2.1</b>	<b>K 2.1</b>	<b>N 2.1</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>
			<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>
			<b>S 1.1</b>	<b>S 1.1</b>

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	inch				□	Tool Identification		CU503200		CU503210		CU503500		CU503700		CU509400	
		l <sub>1</sub>	l <sub>2</sub>	ø d <sub>2</sub>	□		Dimens. ID	Enorm 2-VA NE2	Flutes	Enorm 2-VA NE2	Flutes	Enorm 2-Z	Flutes	Enorm 2-Z TiN	Flutes	Enorm 2-Z TiCN	Flutes	
1	8	6.299	1.181	0.800	0.600	0.8750	<b>.5018</b>	●	4	●	4	● <sup>1)</sup>	5	● <sup>2)</sup>	5	● <sup>3)</sup>	5	
1 1/8	8	7.087	1.181	0.896	0.672	1.0000	<b>.5247</b>	●	4	●	4	●	5	●	5	●	5	
1 1/4	8	7.087	1.181	1.021	0.766	1.1250	<b>.5249</b>	●	4	●	4	●	5	●	5	●	5	
1 3/8	8	7.874	1.181	1.108	0.831	1.2500	<b>.5251</b>	●	5	●	5	●	6	●	6	●	6	
1 1/2	8	7.874	1.181	1.233	0.925	1.3750	<b>.5253</b>	●	5	●	5	●	6	●	6	●	6	
1 5/8	8	7.874	1.181	1.305	0.979	1.5000	<b>.5255</b>	●	5	●	5	●	6	●	6	●	6	
1 3/4	8	7.874	1.181	1.430	1.072	1.6250	<b>.5257</b>	●	6	●	6	●	8	●	8	●	8	
1 7/8	8	8.858	1.299	1.519	1.139	1.7500	<b>.5259</b>	●	6	●	6	●	8	●	8	●	8	
2	8	8.858	1.299	1.644	1.233	1.8750	<b>.5261</b>	●	6	●	6	●	8	●	8	●	8	
2 1/2	8	10.827	1.654	2.100	1.575	2.3750	<b>.5265</b>											

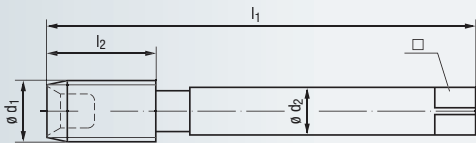
- 1) Chamfer form/threads = E/1.5-2, Tool Identification = CU513500
- 2) Chamfer form/threads = E/1.5-2, Tool Identification = CU513700
- 3) Chamfer form/threads = E/1.5-2, Tool Identification = CU519400



**DIN Length · ANSI Shank**

Overall length acc. to DIN 376

With internal chip collector



Reduced Shank



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials

**UN-8**

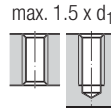
Unified thread  
ASME B1.1



Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape



Range of Application

2BX	<b>3BX 2)</b>
NE2	NE2
C / 2-3	C / 2-3
P / O 1)	P / O 1)

<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>
<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>

**Reduced Shank**

Nominal Size ø d <sub>1</sub>	T.P.I.	inch				Tool Identification		CU803001		CU803011	
		l <sub>1</sub>	l <sub>2</sub>	ø d <sub>2</sub>	□	Dimens. ID	Robust 2X-VA	Flutes	Robust 2X-VA	Flutes	
1	8	6.299	1.417	0.800	0.600	0.8750	.5018			●	5
1 1/8	8	7.087	1.575	0.896	0.672	1.0000	.5247	upon		●	5
1 1/4	8	7.087	1.575	1.021	0.766	1.1250	.5249			●	6
1 3/8	8	7.874	1.654	1.108	0.831	1.2500	.5251	request		●	6
1 1/2	8	7.874	1.654	1.233	0.925	1.3750	.5253			●	6
1 5/8	8	7.874	1.772	1.305	0.979	1.5000	.5255			●	6
1 3/4	8	7.874	1.772	1.430	1.072	1.6250	.5257			●	6
1 7/8	8	8.858	1.969	1.519	1.139	1.7500	.5259			●	6
2	8	8.858	1.969	1.644	1.233	1.8750	.5261			●	6
2 1/4	8	9.843	1.969	1.894	1.420	2.1250	.5263			●	7
2 1/2	8	10.827	2.165	2.100	1.575	2.3750	.5265			●	7
3	8	11.810	2.165	2.100	1.575	2.8750	.5269			●	8
3 1/2	8	12.795	2.362	2.350	1.762	3.3750	.5273			●	10
4	8	13.780	2.362	2.350	1.762	3.8750	.5277			●	10
4 1/2	8	13.780	2.559	2.350	1.762	4.3750	.5281			●	10

1) If possible, use paste lubrication, coating both the tool and the walls of the drilled hole. Lubrication with oil is possible only in the vertical machining of blind holes, if the hole is entirely filled with oil.

2) Class 2B threads may be produced with 3BX taps.

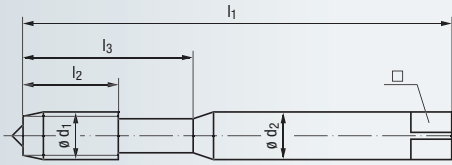
Larger sizes priced upon request. We have experience in making taps as large as 10 inches ø UN.

**The Complete Tool System**

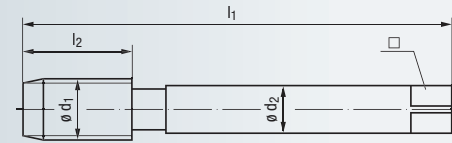
Robust 2X-VA Taps when used with a KSN Type tapping attachment creates the optimal tapping unit!

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank



Reinforced Shank  
(M2 - M10)



Reduced Shank  
(M12 - M52)



**STEEL**  
Steel materials

**STEEL**  
Steel materials

**GJV**  
Cast iron vermicular

**GJV**  
Cast iron vermicular

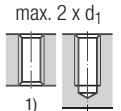
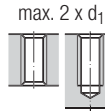
**GJV**  
Cast iron vermicular

**M**

**ISO Metric coarse thread  
DIN 13**

Class of Fit: 6HX  
Coating: 6HX, TICN, TICN  
Technical Characteristics: C/2-3, E/0, E/0, **E/1.5-2**, C/2-3, E/0

Thread Depth and Hole Shape



Range of Application

P 1.1-2.1  
N 2.3

P 1.1-2.1  
N 2.3

K 1.1-2  
K 2.2-4.2

K 1.1-2  
K 2.2-4.2










K 1.1-2  
K 2.2-4.2

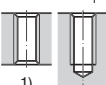



### Reinforced Shank

Reinforced Shank								Tool Identification		B0101001		B0121001		B010R501		B011R501		B195R501		
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Image	Dimens. ID	Rekord 1A-STEEL		Rekord 1A-STEEL-AZ		Rekord 1A-GJV TICN		Rekord 1A-GJV/E TICN		Rekord 1A-GJV IKZ-TICN		
			l <sub>2</sub>	l <sub>3</sub>	l <sub>3</sub>					Flutes	Flutes	Flutes	Flutes	Flutes	Flutes					
M 2	0.4	45	7	12	2.8	2.1	1.6	.0020	*	3										
M 2.5	0.45	50	9	14	2.8	2.1	2.05	.0025	*	3										
M 3	0.5	56	11	18	3.5	2.7	2.5	.0030	*	3	*	3								
M 3.5	0.6	56	12	20	4	3	2.9	.0035	*	3	*	3								
M 4	0.7	63	13	21	4.5	3.4	3.3	.0040	*	3	*	3								
M 4.5	0.75	70	14	25	6	4.9	3.7	.0045	*	3										
M 5	0.8	70	15	25	6	4.9	4.2	.0050	*	3	*	3	*	3	*	3	*	3	*	3
M 6	1	80	17	30	6	4.9	5	.0060	*	3	*	3	*	4	*	4	*	4	*	4
M 8	1.25	90	20	35	8	6.2	6.8	.0080	*	3	*	3	*	4	*	4	*	4	*	4
M 10	1.5	100	22	39	10	8	8.5	.0100	*	3	*	3	*	4	*	4	*	4	*	4

### Reduced Shank

Reduced Shank								Tool Identification		C0101001		C0121001		C010R501		C011R501		C195R501		
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Image	Dimens. ID	Rekord 2A-STEEL		Rekord 2A-STEEL-AZ		Rekord 2A-GJV TICN		Rekord 2A-GJV/E TICN		Rekord 2A-GJV IKZ-TICN		
			l <sub>2</sub>	l <sub>3</sub>	l <sub>3</sub>					Flutes	Flutes	Flutes	Flutes	Flutes	Flutes					
M 12	1.75	110	24	—	9	7	10.2	.0112	*	3	*	3	*	4	*	4	*	4	*	4
M 14	2	110	26	—	11	9	12	.0114	*	3	*	3								
M 16	2	110	27	—	12	9	14	.0116	*	3	*	3								
M 18	2.5	125	30	—	14	11	15.5	.0118	*	4	*	4								
M 20	2.5	140	32	—	16	12	17.5	.0120	*	4	*	4								
M 22	2.5	140	32	—	18	14.5	19.5	.0122	*	4	*	4								
M 24	3	160	34	—	18	14.5	21	.0124	*	4	*	4								
M 27	3	160	36	—	20	16	24	.0127	*	4										
M 30	3.5	180	40	—	22	18	26.5	.0130	*	4										
M 33	3.5	180	40	—	25	20	29.5	.0133	*	4										
M 36	4	200	50	—	28	22	32	.0136	*	4										
M 42	4.5	200	56	—	32	24	37.5	.0142	*	4										
M 45	4.5	220	58	—	36	29	40.5	.0145	*	4										
M 48	5	250	65	—	36	29	43	.0148	*	4										
M 52	5	250	65	—	40	32	47	.0152	*	4										

								
<b>GJV</b> Cast iron vermicular	<b>GAL</b> Aluminum cast alloys	<b>GAL</b> Aluminum cast alloys	<b>MS</b> Copper-zinc alloys	<b>MG</b> Magnesium alloys	<b>FK</b> Short-chipping synthetics	<b>H</b> Materials of high tensile strength	<b>H</b> Materials of high tensile strength	
6HX TICN	6HX TICN	6HX TICN	6HX	6HX GLT-1	6HX NT	6HX NT	6HX NT	Class of Fit Coating Technical Characteristics
E / 1.5-2 E / 0	E / 1.5-2 E / 0	E / 1.5-2 E / 0	C / 2-3 E / 0	C / 2-3 E / 0 / A	C / 2-3 E / 0	C / 2-3 E / 0 / P	C / 2-3 E / 0	

								Thread Depth and Hole Shape
max. 2 x d <sub>1</sub>	max. 2 x d <sub>1</sub>	max. 2 x d <sub>1</sub>				max. 2 x d <sub>1</sub>		
<b>K 1.1-2</b> <b>K 2.2-4.2</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>N 2.3</b>	<b>N 3.1-2</b>	<b>N 4.1, 4.3</b>	<b>P 2.1-4.1</b> <b>K 1.1-4.2</b> <b>N 2.4-7</b> <b>N 4.1, 5.1</b>	<b>P 2.1-4.1</b> <b>K 1.1-4.2</b> <b>N 2.4-7</b> <b>N 4.1, 5.1</b>	Range of Application

B196R501		B1969501		B1099501		B0102501		B010J601		B010T001		B0100501		B1950501		Tool Identification		
Rekord 1A-GJV/E IKZ-TICN	Flutes	Rekord 1A-GAL/E IKZ-TICN	Flutes	Rekord 1A-GAL/E IKZN-TICN	Flutes	Rekord 1A-MS	Flutes	Rekord 1A-MG GLT-1	Flutes	Rekord 1A-FK	Flutes	Rekord 1A-H	Flutes	Rekord 1A-H- IKZ	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
						★	3					★	3			.0020	M 2	0.4
						★	3					●	3			.0025	M 2.5	0.45
						★	3	★	3	★	3	●	3			.0030	M 3	0.5
						★	3	★	3	★	3	●	3			.0035	M 3.5	0.6
						★	3	★	3	★	3	●	3			.0040	M 4	0.7
						★	3	★	3	★	3	●	3	★	3	.0045	M 4.5	0.75
★	3	★	3	★	3	★	3	★	3	★	3	●	3	★	3	.0050	M 5	0.8
★	4	★	3	★	3	★	3	★	3	★	3	●	3	★	3	.0060	M 6	1
★	4	★	3	★	3	★	3	★	3	★	3	●	3	★	3	.0080	M 8	1.25
★	4	★	3	★	3	★	3	★	3	★	3	●	3	★	3	.0100	M 10	1.5

C196R501						C010J601		C0100501		C1950501		Tool Identification		
Rekord 2A-GJV/E IKZ-TICN	Flutes					Rekord 2A-MG GLT-1	Flutes	Rekord 2A-H	Flutes	Rekord 2A-H- IKZ	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
★	4					★	3	●	3	★	3	.0112	M 12	1.75
						★	3	●	3	★	3	.0114	M 14	2
						★	3	●	3	★	3	.0116	M 16	2
								●	4			.0118	M 18	2.5
								●	4	★	4	.0120	M 20	2.5
								●	4			.0122	M 22	2.5
								●	4			.0124	M 24	3
												.0127	M 27	3
												.0130	M 30	3.5
												.0133	M 33	3.5
												.0136	M 36	4
												.0142	M 42	4.5
												.0145	M 45	4.5
												.0148	M 48	5
												.0152	M 52	5

● = In stock    ★ = Allow 7 days for delivery

1) Threading in through holes is possible only with external cooling/lubrication

Product Finder

v<sub>c</sub>

UNC

UNF

UNEF

UN-8

M

MP

NPSM/NPSC

NPSF

Rp (BSPP)

G

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

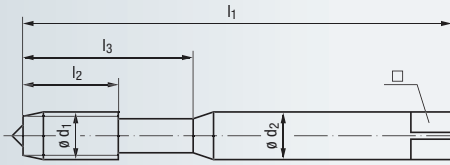
Accessories

Tech. Info

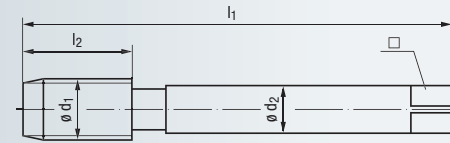


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

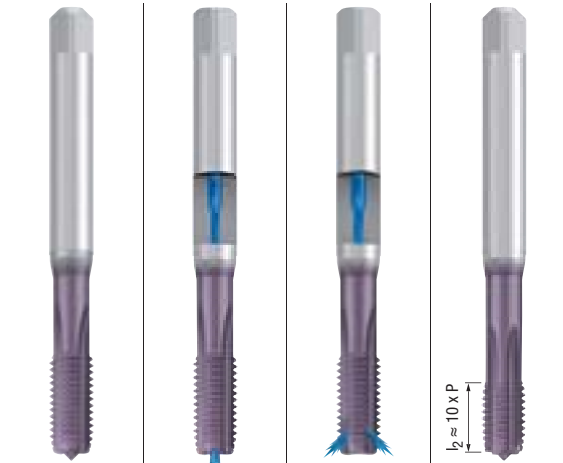
### DIN Length · DIN Shank



Reinforced Shank  
(M2 - M10)



Reduced Shank  
(M12 - M52)



**H** Materials of high tensile strength  
**H** Materials of high tensile strength  
**H** Materials of high tensile strength  
**HCUT** Hardened steels

**M**

ISO Metric coarse thread  
DIN 13

Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application

Class of Fit	Coating	Technical Characteristics	Thread Depth and Hole Shape	Range of Application
6HX	TICN	C / 2-3 E / O / P	max. 2 x d <sub>1</sub>	P 2.1-5.1 K 1.1-4.2 N 2.4-7, 4.1
6HX	TICN	C / 2-3 E / O	max. 2 x d <sub>1</sub>	P 2.1-5.1 K 1.1-4.2 N 2.4-7, 4.1
6HX	TICN	C / 2-3 E / O	max. 2 x d <sub>1</sub>	P 2.1-5.1 K 1.1-4.2 N 2.4-7, 4.1
6HX	TICN	HSSE-PM C / 2-3 O / P	max. 1.5 x d <sub>1</sub>	H 1.1-2

### Reinforced Shank

Reinforced Shank								Tool Identification		B0109101		B1959101		B1069101		B010J901	
Nominal Size	P	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm	Ø d <sub>2</sub>	□	Dimens. ID	Rekord 1A-H TICN	Flutes	Rekord 1A-H-1KZ TICN	Flutes	Rekord 1A-H-1KZN TICN	Flutes	Rekord 1A-HCUT TICN <sup>2)</sup>	Flutes	
M 2	0.4	45	7	12	2.8	2.1	1.6	.0020									
M 2.5	0.45	50	9	14	2.8	2.1	2.05	.0025									
M 3	0.5	56	11	18	3.5	2.7	2.5	.0030									
M 3.5	0.6	56	12	20	4	3	2.9	.0035									
M 4	0.7	63	13	21	4.5	3.4	3.3	.0040	*	3							
M 4.5	0.75	70	14	25	6	4.9	3.7	.0045									
M 5	0.8	70	15	25	6	4.9	4.2	.0050	●	3	*	3	*	3			
M 6	1	80	17	30	6	4.9	5	.0060	●	3	*	3	*	3	*	4	
M 8	1.25	90	20	35	8	6.2	6.8	.0080	●	3	*	3	*	3	*	5	
M 10	1.5	100	22	39	10	8	8.5	.0100	*	3	*	3	*	3	*	5	

### Reduced Shank

Reduced Shank								Tool Identification		C0109101		C1959101		C1069101		C010J901	
Nominal Size	P	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm	Ø d <sub>2</sub>	□	Dimens. ID	Rekord 2A-H TICN	Flutes	Rekord 2A-H-1KZ TICN	Flutes	Rekord 2A-H-1KZN TICN	Flutes	Rekord 2A-HCUT TICN <sup>2)</sup>	Flutes	
M 12	1.75	110	24	—	9	7	10.2	.0112	*	3	*	3	*	3	*	5	
M 14	2	110	26	—	11	9	12	.0114									
M 16	2	110	27	—	12	9	14	.0116	*	3	*	3	*	3	*	6	
M 18	2.5	125	30	—	14	11	15.5	.0118									
M 20	2.5	140	32	—	16	12	17.5	.0120	*	4	*	4	*	4			
M 22	2.5	140	32	—	18	14.5	19.5	.0122	*	4							
M 24	3	160	34	—	18	14.5	21	.0124	*	4							
M 27	3	160	36	—	20	16	24	.0127	*	4							
M 30	3.5	180	40	—	22	18	26.5	.0130	*	4							
M 33	3.5	180	40	—	25	20	29.5	.0133	*	4							
M 36	4	200	50	—	28	22	32	.0136	*	4							
M 42	4.5	200	56	—	32	24	37.5	.0142	*	4							
M 45	4.5	220	58	—	36	29	40.5	.0145	*	4							
M 48	5	250	65	—	36	29	43	.0148									
M 52	5	250	65	—	40	32	47	.0152									

1) Threading in through holes is possible only with external cooling/lubrication

2) Increase drill diameter for taps Rekord 1A-HCUT-TICN by 0.1 mm, for taps Rekord 2A-HCUT-TICN by 0.2 mm

<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>SPEED</b> High-speed cutting	<b>SPEED</b> High-speed cutting	<b>SPEED</b> High-speed cutting	<b>SPEED</b> High-speed cutting	<b>Z-OKO</b> Dry machining and MOL	
6HX TICN	6HX TICN	6HX TICN	6HX TICN	6HX TICN	6HX TICN	6HX TICN	6HX TICN	Class of Fit Coating Technical Characteristics
C / 2-3 E / O / P	C / 2-3 E / O	C / 2-3 E / O	C / 2-3 E / O	C / 2-3 E / O	<b>E / 1.5-2</b> E / O	C / 2-3 E / O	C / 2-3 E / M / A	
max. 2 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 		max. 2 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 	Thread Depth and Hole Shape
<b>P 2.1-5.1</b> <b>K 1.1-4.2</b> <b>N 1.4-6, 2.4-7</b> <b>N 4.1</b>	<b>P 2.1-5.1</b> <b>K 1.1-4.2</b> <b>N 1.4-6, 2.4-7</b> <b>N 4.1</b>	<b>P 2.1-5.1</b> <b>K 1.1-4.2</b> <b>N 1.4-6, 2.4-7</b> <b>N 4.1</b>	<b>K 1.1-4.2</b> <b>N 1.4-6</b> <b>N 2.3, 2.6</b>	<b>K 1.1-4.2</b> <b>N 1.4-6</b> <b>N 2.3, 2.6</b>	<b>K 1.1-4.2</b> <b>N 1.4-6</b> <b>N 2.3, 2.6</b>	<b>K 1.1-4.2</b> <b>N 1.4-6</b> <b>N 2.3, 2.6</b>	<b>P 2.1-5.1</b> <b>K 1.1-4.2</b> <b>N 1.4-6, 2.6-7</b> <b>N 4.1</b>	Range of Application

B0109401		B1959401		B1069401		B3109401		B3159401		B3169401		B3179401		B4109401		Tool Identification		
Rekord 1A-Z TICN	Flutes	Rekord 1A-Z-IKZ TICN	Flutes	Rekord 1A-Z-IKZN TICN	Flutes	Rekord 1A-SPEED TICN	Flutes	Rekord 1A-SPEED IKZ-TICN	Flutes	Rekord 1A-SPEED/E IKZ-TICN	Flutes	Rekord 1A-SPEED IKZN-TICN	Flutes	Rekord 1A-Z-OKO TICN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
																.0020	M 2	0.4
																.0025	M 2.5	0.45
*	3					●	3									.0030	M 3	0.5
																.0035	M 3.5	0.6
*	3					●	3						*	3		.0040	M 4	0.7
																.0045	M 4.5	0.75
*	3	*	3	*	3	●	3	●	3	*	3	●	3	*	3	.0050	M 5	0.8
*	3	*	3	*	3	●	3	●	3	*	3	●	3	*	3	.0060	M 6	1
*	3	*	3	*	3	●	3	●	3	*	3	●	3	*	3	.0080	M 8	1.25
*	3	*	3	*	3	●	3	●	3	*	3	●	3	*	3	.0100	M 10	1.5

C0109401		C1959401		C1069401		C3109401		C3159401		C3169401		C3179401		C4109401		Tool Identification		
Rekord 2A-Z TICN	Flutes	Rekord 2A-Z-IKZ TICN	Flutes	Rekord 2A-Z-IKZN TICN	Flutes	Rekord 2A-SPEED TICN	Flutes	Rekord 2A-SPEED IKZ-TICN	Flutes	Rekord 2A-SPEED/E IKZ-TICN	Flutes	Rekord 2A-SPEED IKZN-TICN	Flutes	Rekord 2A-Z-OKO TICN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
●	3	*	3	*	3	●	3	●	3	*	3	●	3	*	3	.0112	M 12	1.75
																.0114	M 14	2
*	3	*	3	*	3	●	3	●	3			●	3	*	3	.0116	M 16	2
*	4	*	4	*	4	●	4	●	4			●	4	*	4	.0118	M 18	2.5
*	4	*	4	*	4	●	4	●	4			●	4	*	4	.0120	M 20	2.5
*	4	*	4													.0122	M 22	2.5
*	4	*	4													.0124	M 24	3
*	4	*	4													.0127	M 27	3
*	4	*	4													.0130	M 30	3.5
*	4	*	4													.0133	M 33	3.5
*	4	*	4													.0136	M 36	4
*	4	*	4													.0142	M 42	4.5
*	4	*	4													.0145	M 45	4.5
																.0148	M 48	5
																.0152	M 52	5

● = In stock    \* = Allow 7 days for delivery

1) Threading in through holes is possible only with external cooling/lubrication

Product Finder

v<sub>c</sub>

UNC

UNF

UNEF

UN-8

M

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

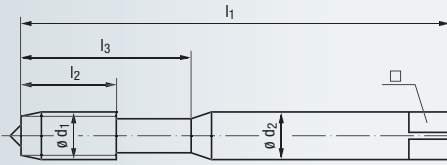
Accessories

Tech. Info

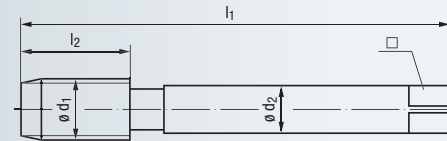


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

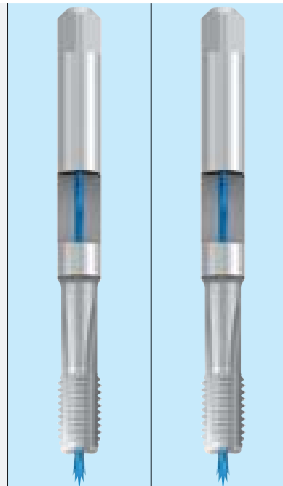
### DIN Length · DIN Shank



Reinforced Shank  
(M3 - M10)



Reduced Shank  
(M12 - M27)



**FK**  
Short-chipping synthetics

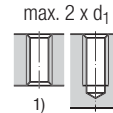
**H**  
Materials of high tensile strength

**M**

**ISO Metric coarse thread  
DIN 13**

Class of Fit **6HX**  
Coating **Carbide**  
Technical Characteristics **C / 2-3**  
 **E**

Thread Depth and Hole Shape



Range of Application

- N 4.1, 4.3-4**
- P 5.1**
- K 1.1-4.2**
- N 1.5-6, 2.6-8**
- N 5.1-2**
- H 1.1-2**

### Reinforced Shank

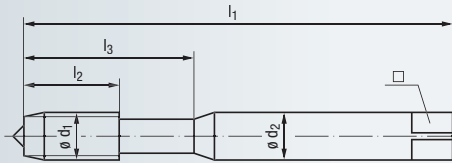
								Tool Identification		B8170901		B1950901					
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□		Dimens. ID	VHM Rekord 1A-FK-IKZ	Flutes	VHM Rekord 1A-H-IKZ	Flutes				
			l <sub>2</sub>	l <sub>3</sub>													
M 3	0.5	56	6	18	3.5	2.7	2.5	.0030	★	3							
M 4	0.7	63	7	23	4.5	3.4	3.3	.0040	★	3							
M 5	0.8	70	8	24	6	4.9	4.2	.0050	★	3	★	3					
M 6	1	80	10	30	6	4.9	5	.0060	★	3	●	3					
M 8	1.25	90	14	35	8	6.2	6.8	.0080	★	3	●	3					
M 10	1.5	100	16	39	10	8	8.5	.0100	★	3	●	3					

### Reduced Shank

								Tool Identification		C1950901							
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□		Dimens. ID	VHM/KHM Rekord 2A-H-IKZ	Flutes						
			l <sub>2</sub>	l <sub>3</sub>													
M 12	1.75	110	18	—	9	7	10.2	.0112	●	3							
M 14	2	110	20	—	11	9	12	.0114	★	4							
M 16	2	110	22	—	12	9	14	.0116	★	4							
M 18	2.5	125	25	—	14	11	15.5	.0118	★	4							
M 20	2.5	140	25	—	16	12	17.5	.0120	★	4							
M 22	2.5	140	27	—	18	14.5	19.5	.0122	★	4							
M 24	3	160	30	—	18	14.5	21	.0124	★	4							
M 27	3	160	30	—	20	16	24	.0127	★	4							

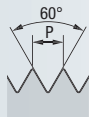
1) Threading in through holes is possible only with external cooling/lubrication

**DIN Length • DIN Shank**



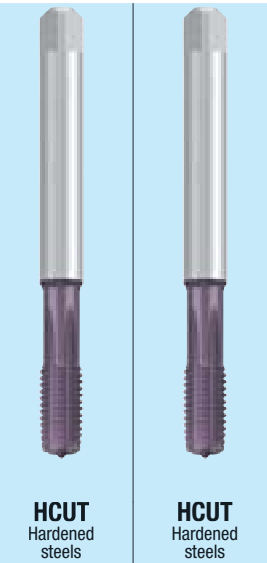
Reinforced Shank

**M**



**ISO Metric coarse thread  
DIN 13**

Class of Fit	6HX
Coating	TICN
Technical Characteristics	<b>Carbide</b>
	<b>D / 4-5</b>
	O / P
Thread Depth and Hole Shape	max. 1.5 x d <sub>1</sub>
Range of Application	H 1.3-4



**HCUT**  
Hardened steels

**HCUT**  
Hardened steels

**Reinforced Shank**

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm				ø d <sub>2</sub>	□	Tool Identification		VHM Rekord 1A-HCUT/D TICN	Flutes	VHM Rekord 1A-HCUT/C TICN <sup>2)</sup>	Flutes
			l <sub>2</sub>	l <sub>3</sub>	□	□			Dimens. ID					
M 4	0.7	63	8	20	4.5	3.4	3.4	.0040	★	4	★	4		
M 5	0.8	70	10	26	6	4.9	4.3	.0050	★	4	★	4		
M 6	1	80	12	28	6	4.9	5.1	.0060	★	4	★	4		
M 8	1.25	90	15	35	8	6.2	6.9	.0080	★	5	★	5		
M 10	1.5	100	18	38	10	8	8.6	.0100	★	5	★	5		
M 12	1.75	110	21	41	12	9	10.4	.0112	★	5	★	5		
M 16	2	110	24	44	16	12	14.2	.0116	★	6	★	6		

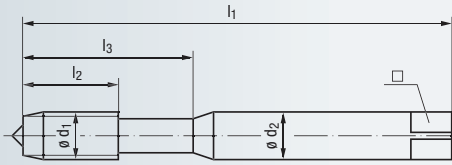
<sup>2)</sup> Please note: Use solid carbide tap VHM-Rekord 1A-HCUT/D-TICN as No.1 tap!

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

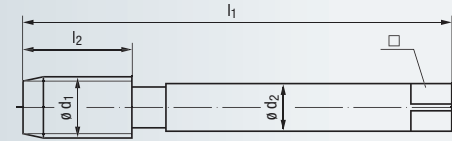


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank



Reinforced Shank  
(M2 - M10)



Reduced Shank  
(M12 - M52)

# M



ISO Metric coarse thread  
DIN 13

Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application



**STEEL**  
Steel materials

**STEEL**  
Steel materials

**STEEL**  
Steel materials

**STEEL**  
Steel materials

**STEEL**  
Steel materials

ISO 2/6H	<b>ISO 3/6G</b>	<b>7G</b>	ISO 2/6H	ISO 2/6H
B / 4-5	B / 4-5	B / 4-5	<b>LH</b> B / 4-5	B / 4-5
E / 0	E / 0	E / 0	E / 0	E / 0

max. 3 x d<sub>1</sub>












### Reinforced Shank

Nominal Size		P	l <sub>1</sub>	l <sub>2</sub>	mm	l <sub>3</sub>	Ø d <sub>2</sub>	□	Tool Identification		B0201000		B0201020		B0201030		B0201050		B0221000	
Ø d <sub>1</sub>									Rekord 1B-STEEL	Flutes	Rekord 1B-STEEL	Flutes	Rekord 1B-STEEL	Flutes	Rekord 1B-STEEL-LH	Flutes	Rekord 1B-STEEL-AZ	Flutes		
M 2	0.4	45	7	12	2.8	2.1	1.6	.0020	●	2	★	2	★	2	★	2	★	2	★	
M 2.5	0.45	50	9	14	2.8	2.1	2.05	.0025	★	2	★	2	★	2	★	2	★	2	★	
M 3	0.5	56	11	18	3.5	2.7	2.5	.0030	●	3	★	3	★	3	★	3	★	3	★	
M 3.5	0.6	56	12	20	4	3	2.9	.0035	★	3	★	3	★	3	★	3	★	3	★	
M 4	0.7	63	13	21	4.5	3.4	3.3	.0040	●	3	★	3	★	3	★	3	★	3	★	
M 4.5	0.75	70	14	25	6	4.9	3.7	.0045	★	3	★	3	★	3	★	3	★	3	★	
M 5	0.8	70	15	25	6	4.9	4.2	.0050	●	3	★	3	★	3	★	3	★	3	★	
M 6	1	80	17	30	6	4.9	5	.0060	●	3	★	3	★	3	★	3	★	3	★	
M 8	1.25	90	20	35	8	6.2	6.8	.0080	●	3	★	3	★	3	★	3	★	3	★	
M 10	1.5	100	22	39	10	8	8.5	.0100	●	3	★	3	★	3	★	3	★	3	★	

### Reduced Shank

Nominal Size		P	l <sub>1</sub>	l <sub>2</sub>	mm	l <sub>3</sub>	Ø d <sub>2</sub>	□	Tool Identification		C0201000		C0201020		C0201030		C0201050		C0221000	
Ø d <sub>1</sub>									Rekord 2B-STEEL	Flutes	Rekord 2B-STEEL	Flutes	Rekord 2B-STEEL	Flutes	Rekord 2B-STEEL-LH	Flutes	Rekord 2B-STEEL-AZ	Flutes		
M 12	1.75	110	24	—	9	7	10.2	.0112	●	3	★	3	★	3	★	3	★	3	★	
M 14	2	110	26	—	11	9	12	.0114	●	3	★	3	★	3	★	3	★	3	★	
M 16	2	110	27	—	12	9	14	.0116	●	3	★	3	★	3	★	3	★	3	★	
M 18	2.5	125	30	—	14	11	15.5	.0118	●	3	★	3	★	3	★	3	★	3	★	
M 20	2.5	140	32	—	16	12	17.5	.0120	●	3	★	3	★	3	★	3	★	3	★	
M 22	2.5	140	32	—	18	14.5	19.5	.0122	●	3	★	3	★	3	★	3	★	3	★	
M 24	3	160	34	—	18	14.5	21	.0124	●	3	★	3	★	3	★	3	★	3	★	
M 27	3	160	36	—	20	16	24	.0127	★	3	★	3	★	3	★	3	★	3	★	
M 30	3.5	180	40	—	22	18	26.5	.0130	★	4	★	4	★	4	★	4	★	4	★	
M 33	3.5	180	40	—	25	20	29.5	.0133	★	4	★	4	★	4	★	4	★	4	★	
M 36	4	200	50	—	28	22	32	.0136	★	4	★	4	★	4	★	4	★	4	★	
M 42	4.5	200	56	—	32	24	37.5	.0142	★	4	★	4	★	4	★	4	★	4	★	
M 45	4.5	220	58	—	36	29	40.5	.0145	★	4	★	4	★	4	★	4	★	4	★	
M 48	5	250	65	—	36	29	43	.0148	★	4	★	4	★	4	★	4	★	4	★	
M 52	5	250	65	—	40	32	47	.0152	★	4	★	4	★	4	★	4	★	4	★	



								
<b>STEEL</b> Steel materials	<b>VA</b> Stainless steel materials	<b>VA</b> Stainless steel materials	<b>VA</b> Stainless steel materials	<b>VA</b> Stainless steel materials	<b>AL</b> Aluminum wrought alloys	<b>AL</b> Aluminum wrought alloys	<b>Z</b> CNC-controlled machines	
ISO 2/6H	ISO 2/6H	<b>ISO 3/6G</b>	<b>7G</b>	ISO 2/6H	ISO 2/6H	ISO 2/6H	6HX	Class of Fit
TIN	NT	NT	NT	NT		GLT-8	TIN	Coating
B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / approx. 3	B / approx. 3	B / 4-5	Technical Characteristics
E / 0	E / 0 / P	E / 0 / P	E / 0 / P	E / 0 / P	E / 0	E / 0	E / 0 / P	

max. 3 x d<sub>1</sub>



Thread Depth and Hole Shape

<b>P 1.1-4.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>N 1.1-4</b>	<b>N 1.1-4</b>	<b>P 1.1-5.1</b>	Range of Application
<b>M 1.1-3.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>			<b>M 1.1-3.1</b>	
<b>K 2.1-2.2</b>	<b>K 2.1</b>	<b>K 2.1</b>	<b>K 2.1</b>	<b>K 2.1</b>			<b>K 2.1</b>	
<b>N 1.4-5</b>	<b>N 1.5, 2.4-5</b>	<b>N 1.5, 2.4-5</b>	<b>N 1.5, 2.4-5</b>	<b>N 1.5, 2.4-5</b>			<b>N 1.4-2.2</b>	
<b>N 2.2, 2.4-5</b>							<b>S 1.1</b>	

B0201400		B0203000		B0203020		B0203030		B0223000		B0204500		B020S800		B0203701		Tool Identification		
Rekord 1B-STEEL TIN	Flutes	Rekord 1B-VA	Flutes	Rekord 1B-VA	Flutes	Rekord 1B-VA	Flutes	Rekord 1B-VA-AZ	Flutes	Rekord 1B-AL	Flutes	Rekord 1B-AL GLT-8	Flutes	Rekord 1B-Z TIN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
●	2	●	2	★	2	★	2	★	2	★	2	★	2			.0020	M 2	0.4
●	2	★	2	★	2	★	2	★	2	★	2	★	2			.0025	M 2.5	0.45
●	3	●	3	★	3	★	3	★	3	★	2	★	2	★	3	.0030	M 3	0.5
		●	3	★	3			★	3	★	2					.0035	M 3.5	0.6
●	3	●	3	★	3	★	3	★	3	★	2	★	2	★	3	.0040	M 4	0.7
		●	3	★	3			★	3	★	2					.0045	M 4.5	0.75
●	3	●	3	★	3	★	3	★	3	★	2	★	2	★	3	.0050	M 5	0.8
●	3	●	3	★	3	★	3	★	3	★	2	★	2	★	3	.0060	M 6	1
●	3	●	3	★	3	★	3	★	3	★	2	★	2	★	4	.0080	M 8	1.25
●	3	●	3	★	3	★	3	★	3	★	2	★	2	★	4	.0100	M 10	1.5

C0201400		C0203000		C0203020		C0203030		C0223000		C0204500		C020S800		C0203701		Tool Identification		
Rekord 2B-STEEL TIN	Flutes	Rekord 2B-VA	Flutes	Rekord 2B-VA	Flutes	Rekord 2B-VA	Flutes	Rekord 2B-VA-AZ	Flutes	Rekord 2B-AL	Flutes	Rekord 2B-AL GLT-8	Flutes	Rekord 2B-Z TIN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
●	3	●	3	★	3	★	3	★	3	★	3	★	3	★	4	.0112	M 12	1.75
●	3	●	3			★	3	★	3	★	3					.0114	M 14	2
●	3	●	3	★	3	★	3	★	3	★	3	★	3	★	4	.0116	M 16	2
●	3	●	3					★	3	★	3					.0118	M 18	2.5
●	3	●	3	★	3			★	3	★	3			★	4	.0120	M 20	2.5
●	3	●	3					★	3	★	3			★	4	.0122	M 22	2.5
●	3	●	3					★	3	★	3	★	3	★	4	.0124	M 24	3
		●	3					★	3					★	4	.0127	M 27	3
		●	4					★	4					★	4	.0130	M 30	3.5
																.0133	M 33	3.5
																.0136	M 36	4
																.0142	M 42	4.5
																.0145	M 45	4.5
																.0148	M 48	5
																.0152	M 52	5

● = In stock    ★ = Allow 7 days for delivery

Product Finder

v<sub>c</sub>

UNC

UNF

UNEF

UN-8

M

MP

NPSM/NPSC

NPSF

Rp (BSPP)

G

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

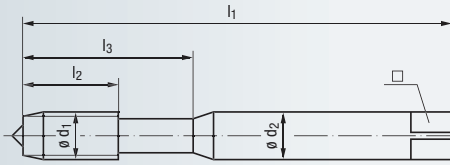
Accessories

Tech. Info

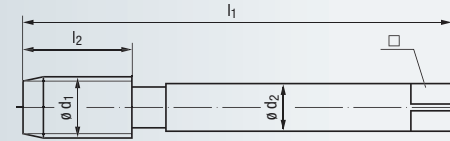


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank



Reinforced Shank  
(M2 - M10)



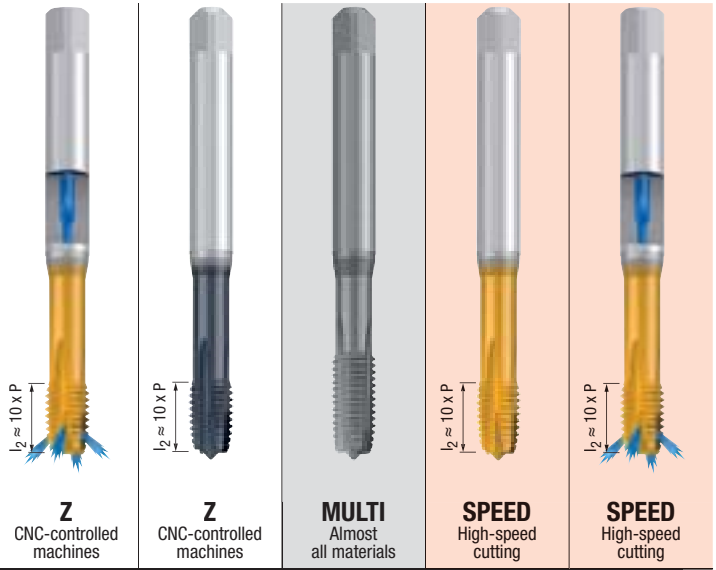
Reduced Shank  
(M12 - M52)

# M



ISO Metric coarse thread  
DIN 13

Class of Fit  
Coating  
Technical Characteristics  
Thread Depth and Hole Shape



6HX	6HX	ISO 2/6H	6HX	6HX
TIN	GLT-1	NT2	TIN	TIN
B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / 4-5
E / 0	E / 0 / P	E / 0 / P	E / 0	E / 0

max. 3 x d<sub>1</sub>

<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>
<b>K 2.1</b>	<b>K 2.1</b>	<b>K 1.1-4.2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>
<b>N 1.4-2.2</b>	<b>N 1.4-2.2</b>	<b>N 1.4-5, 2.4-5</b>	<b>N 1.1-2.2</b>	<b>N 1.1-2.2</b>
<b>S 1.1</b>	<b>S 1.1</b>			

### Reinforced Shank

Reinforced Shank								Tool Identification		B1083701		B020C401		B5207300		B3203701		B3253701	
Nominal Size	P	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm	Ø d <sub>2</sub>	□	Image	Dimens. ID	Rekord 1B-Z- IKZN TIN	Flutes	Rekord 1B-Z GLT-1	Flutes	Rekord 1B-MULTI NT2	Flutes	Rekord 1B-SPEED TIN	Flutes	Rekord 1B-SPEED IKZN-TIN	Flutes
M 2	0.4	45	7	12	2.8	2.1			1.6	.0020				*	2				
M 2.5	0.45	50	9	14	2.8	2.1			2.05	.0025				*	2				
M 3	0.5	56	11	18	3.5	2.7			2.5	.0030		*	3	*	3	●	3		
M 3.5	0.6	56	12	20	4	3			2.9	.0035			*	3	●	3			
M 4	0.7	63	13	21	4.5	3.4			3.3	.0040		*	3	*	3	●	3		
M 4.5	0.75	70	14	25	6	4.9			3.7	.0045			*	3	●	3			
M 5	0.8	70	15	25	6	4.9			4.2	.0050	*	3	*	3	●	3	●	3	
M 6	1	80	17	30	6	4.9			5	.0060	*	3	*	3	●	3	●	3	
M 8	1.25	90	20	35	8	6.2			6.8	.0080	*	4	*	4	●	4	●	4	
M 10	1.5	100	22	39	10	8			8.5	.0100	*	4	*	4	●	4	●	4	

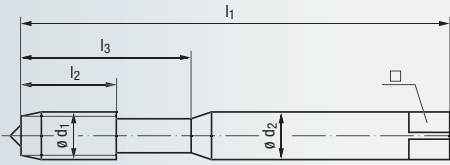
### Reduced Shank

Reduced Shank								Tool Identification		C1083701		C020C401		C5207300		C3203701		C3253701		
Nominal Size	P	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm	Ø d <sub>2</sub>	□	Image	Dimens. ID	Rekord 2B-Z- IKZN TIN	Flutes	Rekord 2B-Z GLT-1	Flutes	Rekord 2B-MULTI NT2	Flutes	Rekord 2B-SPEED TIN	Flutes	Rekord 2B-SPEED IKZN-TIN	Flutes	
M 12	1.75	110	24	—	9	7			10.2	.0112	*	4	*	4	*	3	●	4	●	4
M 14	2	110	26	—	11	9			12	.0114			*	3						
M 16	2	110	27	—	12	9			14	.0116	*	4	*	4	*	3	●	4	●	4
M 18	2.5	125	30	—	14	11			15.5	.0118			*	3						
M 20	2.5	140	32	—	16	12			17.5	.0120	*	4	*	4	*	3	●	4		
M 22	2.5	140	32	—	18	14.5			19.5	.0122			*	3						
M 24	3	160	34	—	18	14.5			21	.0124			*	3						
M 27	3	160	36	—	20	16			24	.0127			*	3						
M 30	3.5	180	40	—	22	18			26.5	.0130			*	4						
M 33	3.5	180	40	—	25	20			29.5	.0133										
M 36	4	200	50	—	28	22			32	.0136										
M 42	4.5	200	56	—	32	24			37.5	.0142										
M 45	4.5	220	58	—	36	29			40.5	.0145										
M 48	5	250	65	—	36	29			43	.0148										
M 52	5	250	65	—	40	32			47	.0152										

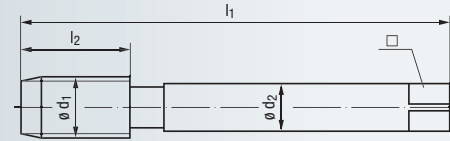


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank



Reinforced Shank  
(M2 - M10)



Reduced Shank  
(M12 - M52)



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials

**M**

**ISO Metric coarse thread  
DIN 13**

Class of Fit: **ISO 2/6H**  
Coating: **R15**  
Technical Characteristics: **E / 1.5-2**

Thread Depth and Hole Shape

Range of Application

ISO 2/6H	<b>ISO 3/6G</b>	ISO 2/6H	ISO 2/6H	ISO 2/6H
R15	R15	R15	R15	R15
E / 1.5-2	<b>E / 1.5-2</b>	C / 2-3	C / 2-3	C / 2-3
E / O / P	E / O / P	E / O	E / O / P	E / O

max. 2 x d<sub>1</sub>



<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-3.1</b>
<b>K 2.1</b>	<b>K 2.1</b>	<b>K 2.1</b>	<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>
<b>N 2.4-5</b>	<b>N 2.4-5</b>	<b>N 2.4-5</b>	<b>N 2.4-5</b>	<b>N 1.4-5, 2.4-5</b>

### Reinforced Shank

Reinforced Shank										Tool Identification		B0463000		B0463020		B0963000		B0403000		B0969300		
Nominal Size	P	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
Ø d <sub>1</sub>																						
M 2	0.4	45	7	12	2.8	2.1	1.6	.0020	★	2								★	2			
M 2.5	0.45	50	9	14	2.8	2.1	2.05	.0025	★	2								★	2			
M 3	0.5	56	11	18	3.5	2.7	2.5	.0030	●	2	★	2						★	2			
M 3.5	0.6	56	12	20	4	3	2.9	.0035														
M 4	0.7	63	13	21	4.5	3.4	3.3	.0040	●	3	★	3						★	3			
M 4.5	0.75	70	14	25	6	4.9	3.7	.0045														
M 5	0.8	70	15	25	6	4.9	4.2	.0050	●	3	★	3	★	3	★	3	★	3	★	3	★	3
M 6	1	80	17	30	6	4.9	5	.0060	●	3	★	3	★	3	★	3	★	3	★	3	★	3
M 8	1.25	90	20	35	8	6.2	6.8	.0080	●	3	★	3	★	3	★	3	★	3	★	3	★	3
M 10	1.5	100	22	39	10	8	8.5	.0100	★	3	★	3	★	3	★	3	★	3	★	3	★	3

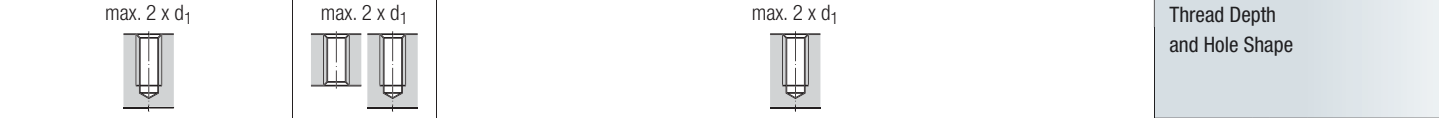
### Reduced Shank

Reduced Shank										Tool Identification		C0463000		C0463020		C0963000		C0403000		C0969300			
Nominal Size	P	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
Ø d <sub>1</sub>																							
M 12	1.75	110	24	—	9	7	10.2	.0112	★	3				★	3	★	3	★	3	★	3	★	3
M 14	2	110	26	—	11	9	12	.0114	★	3	upon			★	3	★	3	★	3	★	3	★	3
M 16	2	110	27	—	12	9	14	.0116	★	3				★	3	★	3	★	3	★	3	★	3
M 18	2.5	125	30	—	14	11	15.5	.0118	★	3	request					★	3	★	3	★	3	★	3
M 20	2.5	140	32	—	16	12	17.5	.0120	★	3				★	3	★	3	★	3	★	3	★	3
M 22	2.5	140	32	—	18	14.5	19.5	.0122															
M 24	3	160	34	—	18	14.5	21	.0124	★	3								★	3				
M 27	3	160	36	—	20	16	24	.0127															
M 30	3.5	180	40	—	22	18	26.5	.0130															
M 33	3.5	180	40	—	25	20	29.5	.0133															
M 36	4	200	50	—	28	22	32	.0136															
M 42	4.5	200	56	—	32	24	37.5	.0142															
M 45	4.5	220	58	—	36	29	40.5	.0145															
M 48	5	250	65	—	36	29	43	.0148															
M 52	5	250	65	—	40	32	47	.0152															



GAL Aluminum cast alloys	PVC Long-chipping synthetics	PVC Long-chipping synthetics	TI Titanium	TI Titanium	TILEG Titanium alloys	NI Nickel alloys	Z CNC-controlled machines
6HX	6HX	6HX	6HX	6HX	6HX	6HX	6HX
TICN	CRN	CRN	NT2	TICN	TICN	TICN	TIN
R15	R15	R15	R15	R15	R15	R10	R15
E / 1.5-2	E / 1.5-2	E / 1.5-2	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3
E / O	E	E	E / O / P	E / O / P	E / O / P	O / P	E / O / P

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

N 1.4-6	N 4.2	N 4.2	P 4.1-5.1 M 3.1-4.1 K 2.2 N 2.4-5, 2.7 S 1.1-2.2, 2.4	P 4.1-5.1 M 3.1-4.1 K 2.2 N 2.4-5, 2.7 S 1.1-2.2, 2.4	S 1.2-3	N 2.8 S 2.3, 2.5-6	P 1.1-5.1 M 1.1-3.1 K 2.1-2 N 1.4-6, 2.4-5
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Range of Application

B0989501		B046L801		B041L801		B0456001		B0459601		B040V401		B438J401		B0453701		Tool Identification		
Rekord 1D-GAL/E IKZ-TICN	Flutes	Rekord 1D-PVC/E CRN	Flutes	Rekord 1DF-PVC/E CRN	Flutes	Rekord 1D-TI	Flutes	Rekord 1D-TI TICN	Flutes	Rekord 1DF-TILEG TICN	Flutes	Rekord 1DF-NI TICN	Flutes	Rekord 1D-Z TIN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
										upon						.0020	M 2	0.4
		*	2	*	2	●	2	*	2	request		*	2	*	2	.0025	M 2.5	0.45
		*	3	*	3	●	3	*	3			*	3	*	3	.0030	M 3	0.5
						●	3	*	3			*	3	*	3	.0035	M 3.5	0.6
						●	3	*	3			*	3	*	3	.0040	M 4	0.7
*	3	*	3	*	3	●	3	*	3			*	3	*	3	.0045	M 4.5	0.75
*	3	*	3	*	3	●	3	*	3			*	3	*	3	.0050	M 5	0.8
*	3	*	3	*	3	●	3	*	3			*	3	*	3	.0060	M 6	1
*	3	*	3	*	3	●	3	*	3			*	3	*	3	.0080	M 8	1.25
*	3	*	3	*	3	●	3	*	3			*	3	*	3	.0100	M 10	1.5

				C0456001		C0459601		C438J401		C0453701		Tool Identification				
				Rekord 2D-TI	Flutes	Rekord 2D-TI TICN	Flutes		Flutes	Rekord 2DF-NI TICN	Flutes	Rekord 2D-Z TIN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
				●	3	*	3			*	3	*	3	.0112	M 12	1.75
				●	3	*	3			*	3	*	3	.0114	M 14	2
				●	3	*	3			*	3	*	3	.0116	M 16	2
				●	3	*	3			*	3	*	3	.0118	M 18	2.5
				●	3	*	3			*	3	*	3	.0120	M 20	2.5
				●	3	*	3			*	3	*	3	.0122	M 22	2.5
				●	3	*	3			*	3	*	3	.0124	M 24	3
				●	3	*	3			*	3	*	3	.0127	M 27	3
				●	4	*	4			*	4	*	4	.0130	M 30	3.5
				●	4	*	4			*	4	*	4	.0133	M 33	3.5
				●	4	*	4			*	4	*	4	.0136	M 36	4
				●	4	*	4			*	4	*	4	.0142	M 42	4.5
				●	4	*	4			*	4	*	4	.0145	M 45	4.5
														.0148	M 48	5
														.0152	M 52	5

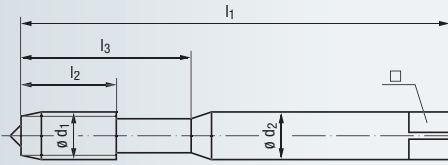
● = In stock    ★ = Allow 7 days for delivery

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- R<sub>p</sub> (BSPP)
- G
- PT
- NPTF
- R<sub>c</sub> (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

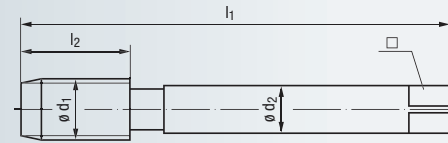


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank

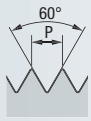


Reinforced Shank  
(M2 - M10)



Reduced Shank  
(M12 - M52)

# M



ISO Metric coarse thread  
DIN 13

Class of Fit  
Coating  
Technical Characteristics

Thread Depth  
and Hole Shape

Range of Application

<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>SPEED</b> High-speed cutting	<b>SPEED</b> High-speed cutting
6HX	6HX	6HX	6HX	6HX
TIN	TIN	TIN	TIN	TIN
R15	<b>BF</b> R15	<b>BF</b> R15	R15	R15
C/2-3	C/2-3	C/2-3	C/2-3	C/2-3
E/O	E/O/P	E/O	E/O	E/O

max. 2 x d<sub>1</sub>



<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>
<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>
<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-2.1</b>	<b>N 1.4-2.1</b>

### Reinforced Shank

Reinforced Shank										Tool Identification		B0963701		B4223701		B4253701		B3223701		B3233701	
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□		Dimens. ID	Rekord 1D-Z- <b>IKZ</b> TIN	Flutes	Rekord 1D-Z- <b>BF</b> TIN	Flutes	Rekord 1D-Z- <b>BF- IKZ</b> TIN	Flutes	Rekord 1D- <b>SPEED</b> TIN	Flutes	Rekord 1D- <b>SPEED</b> IKZ-TIN	Flutes		
			l <sub>2</sub>	l <sub>3</sub>	l <sub>3</sub>																
M 2	0.4	45	4	12	2.8	2.1	1.6	.0020													
M 2.5	0.45	50	5	14	2.8	2.1	2.05	.0025													
M 3	0.5	56	6	18	3.5	2.7	2.5	.0030			*	2									
M 3.5	0.6	56	7	20	4	3	2.9	.0035													
M 4	0.7	63	7	21	4.5	3.4	3.3	.0040			*	3									
M 4.5	0.75	70	8	25	6	4.9	3.7	.0045			*	3	*	3	*	3	*	3	*	3	
M 5	0.8	70	8	25	6	4.9	4.2	.0050	*	3	*	3	*	3	*	3	*	3	*	3	
M 6	1	80	10	30	6	4.9	5	.0060	*	3	*	3	*	3	*	3	*	3	*	3	
M 8	1.25	90	14	35	8	6.2	6.8	.0080	*	3	*	3	*	3	*	3	*	3	*	3	
M 10	1.5	100	16	39	10	8	8.5	.0100	*	3	*	3	*	3	*	3	*	3	*	3	

### Reduced Shank

Reduced Shank										Tool Identification		C0963701		C4223701		C4253701		C3223701		C3233701	
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□		Dimens. ID	Rekord 2D-Z- <b>IKZ</b> TIN	Flutes	Rekord 2D-Z- <b>BF</b> TIN	Flutes	Rekord 2D-Z- <b>BF- IKZ</b> TIN	Flutes	Rekord 2D- <b>SPEED</b> TIN	Flutes	Rekord 2D- <b>SPEED</b> IKZ-TIN	Flutes		
			l <sub>2</sub>	l <sub>3</sub>	l <sub>3</sub>																
M 12	1.75	110	18	—	9	7	10.2	.0112	*	3	*	3	*	3	*	3	*	3	*	3	
M 14	2	110	20	—	11	9	12	.0114	*	3	*	3	*	3	*	3	*	3	*	3	
M 16	2	110	22	—	12	9	14	.0116	*	3	*	3	*	3	*	3	*	3	*	3	
M 18	2.5	125	25	—	14	11	15.5	.0118	*	3	*	3	*	3	*	3	*	3	*	3	
M 20	2.5	140	25	—	16	12	17.5	.0120	*	3	*	3	*	3	*	3	*	3	*	3	
M 22	2.5	140	27	—	18	14.5	19.5	.0122	*	3	*	3	*	3	*	3	*	3	*	3	
M 24	3	160	30	—	18	14.5	21	.0124	*	3	*	3	*	3	*	3	*	3	*	3	
M 27	3	160	30	—	20	16	24	.0127	*	3	*	3	*	3	*	3	*	3	*	3	
M 30	3.5	180	35	—	22	18	26.5	.0130	*	4	*	4	*	4	*	4	*	4	*	4	
M 33	3.5	180	35	—	25	20	29.5	.0133	*	4	*	4	*	4	*	4	*	4	*	4	
M 36	4	200	40	—	28	22	32	.0136	*	4	*	4	*	4	*	4	*	4	*	4	
M 42	4.5	200	45	—	32	24	37.5	.0142	*	4	*	4	*	4	*	4	*	4	*	4	
M 45	4.5	220	45	—	36	29	40.5	.0145	*	4	*	4	*	4	*	4	*	4	*	4	
M 48	5	250	50	—	36	29	43	.0148	*	4	*	4	*	4	*	4	*	4	*	4	
M 52	5	250	50	—	40	32	47	.0152	*	4	*	4	*	4	*	4	*	4	*	4	

VA Stainless steel materials	STEEL Steel materials	STEEL Steel materials	STEEL Steel materials	STEEL Steel materials	STEEL Steel materials	STEEL Steel materials	STEEL Steel materials	VA Stainless steel materials		
6HX	ISO 2/6H	<b>ISO 3/6G</b>	<b>7G</b>	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	Class of Fit	
<b>Carbide</b> R15	R35	R35	R35	<b>LH, L35</b>	R35	R35	R35	R35	Coating	
<b>E / 1.5-2</b>	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	Technical Characteristics	
E / 0	E / 0	E / 0	E / 0	E / 0	E / 0	E / 0	E / 0	E / O / P		
max. 2 x d <sub>1</sub> 	max. 2.5 x d <sub>1</sub> 								Thread Depth and Hole Shape	
<b>P 5.1</b> <b>K 1.1-4.2</b> <b>N 1.5-6, 2.6-8</b> <b>N 5.1-2</b>	<b>P 1.1-2.1</b> <b>N 2.2</b>	<b>P 1.1-2.1</b> <b>N 2.2</b>	<b>P 1.1-2.1</b> <b>N 2.2</b>	<b>P 1.1-2.1</b> <b>N 2.2</b>	<b>P 1.1-2.1</b> <b>N 2.2</b>	<b>P 1.1-2.1</b> <b>N 2.2</b>	<b>P 1.1-4.1</b> <b>M 1.1-3.1</b> <b>K 2.1-2.2</b> <b>N 2.2, 2.4-5</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1</b> <b>K 2.1</b>	Range of Application	
<b>B0980101</b>	<b>B0501000</b>	<b>B0501020</b>	<b>B0501030</b>	<b>B0501050</b>	<b>B0601000</b>	<b>B0501400</b>	<b>B0503000</b>	<b>Tool Identification</b>		
<b>VHM Rekord 1D-VA/E-IKZ</b>	<b>Enorm 1-STEEL</b>	<b>Enorm 1-STEEL</b>	<b>Enorm 1-STEEL</b>	<b>Enorm 1-STEEL-LH</b>	<b>Enorm 1-STEEL-X</b>	<b>Enorm 1-STEEL TIN</b>	<b>Enorm 1-VA</b>	<b>Dimens. ID</b>	<b>Nominal Size ø d<sub>1</sub></b>	<b>P</b>
	● 2	★ 2	★ 2	★ 2	★ 2	★ 2	★ 2	.0020	M 2	0.4
	★ 2	★ 2	★ 2	★ 2	★ 2	★ 2	★ 2	.0025	M 2.5	0.45
	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0030	M 3	0.5
	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0035	M 3.5	0.6
	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0040	M 4	0.7
	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0045	M 4.5	0.75
★ 3	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0050	M 5	0.8
★ 3	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0060	M 6	1
★ 3	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0080	M 8	1.25
★ 3	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0100	M 10	1.5
<b>C0980101</b>	<b>C0501000</b>	<b>C0501020</b>	<b>C0501030</b>	<b>C0501050</b>	<b>C0601000</b>	<b>C0501400</b>	<b>C0503000</b>	<b>Tool Identification</b>		
<b>VHM Rekord 2D-VA/E-IKZ</b>	<b>Enorm 2-STEEL</b>	<b>Enorm 2-STEEL</b>	<b>Enorm 2-STEEL</b>	<b>Enorm 2-STEEL-LH</b>	<b>Enorm 2-STEEL-X</b>	<b>Enorm 2-STEEL TIN</b>	<b>Enorm 2-VA</b>	<b>Dimens. ID</b>	<b>Nominal Size ø d<sub>1</sub></b>	<b>P</b>
★ 3	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0112	M 12	1.75
	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0114	M 14	2
	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0116	M 16	2
	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0118	M 18	2.5
	● 3	★ 3	★ 3	★ 3	★ 3	★ 3	★ 3	.0120	M 20	2.5
	● 4	★ 4	★ 4	★ 4	★ 4	★ 4	★ 4	.0122	M 22	2.5
	● 4	★ 4	★ 4	★ 4	★ 4	★ 4	★ 4	.0124	M 24	3
	★ 4						★ 4	.0127	M 27	3
	● 4						★ 4	.0130	M 30	3.5
	★ 4							.0133	M 33	3.5
	★ 4							.0136	M 36	4
	★ 5							.0142	M 42	4.5
	★ 5							.0145	M 45	4.5
	★ 5							.0148	M 48	5
	★ 5							.0152	M 52	5

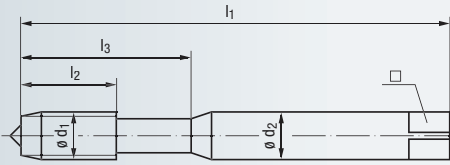
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- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- R<sub>p</sub> (BSPP)
- G
- PT
- NPTF
- R<sub>c</sub> (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

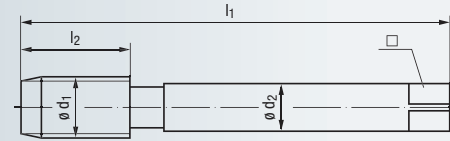


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank



Reinforced Shank  
(M2 - M10)



Reduced Shank  
(M12 - M52)



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



**AL**  
Aluminum wrought alloys



**AL**  
Aluminum wrought alloys



**Z**  
CNC-controlled machines

**M**

**ISO Metric coarse thread  
DIN 13**

Class of Fit: ISO 2/6H  
Coating: R35  
Technical Characteristics: C/2-3, E/O/P

Thread Depth and Hole Shape: max. 2.5 x d<sub>1</sub>

Range of Application

ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H
NE2	NE2		GLT-8	
R35	R35	R45	R45	R45
C/2-3	C/2-3	C/2-3	C/2-3	C/2-3
E/O/P	E/O/P	E/O	E/O	E/O/P
max. 2.5 x d <sub>1</sub>			max. 3 x d <sub>1</sub>	
P 1.1-3.1 M 1.1-2.1 K 2.1		N 1.1-4		P 1.1-4.1 M 1.1-2.1 N 2.1

### Reinforced Shank

Reinforced Shank								Tool Identification		B0603000		B0503200		B0504500		B050S800		B0503500	
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	l <sub>2</sub>	mm l <sub>3</sub>	ø d <sub>2</sub>	□	Dimens. ID	Enorm 1-VA-X	Flutes	Enorm 1-VA NE2	Flutes	Enorm 1-AL	Flutes	Enorm 1-AL GLT-8	Flutes	Enorm 1-Z	Flutes		
M 2	0.4	45	4	12	2.8	2.1	1.6	.0020		●	2	*	2	*	2	*			
M 2.5	0.45	50	5	14	2.8	2.1	2.05	.0025		*	2	*	2	*	2	*			
M 3	0.5	56	6	18	3.5	2.7	2.5	.0030	*	●	3	*	2	*	2	*	3		
M 3.5	0.6	56	7	20	4	3	2.9	.0035		●	3	*	2	*	2	*	3		
M 4	0.7	63	7	21	4.5	3.4	3.3	.0040	*	●	3	*	2	*	2	*	3		
M 4.5	0.75	70	8	25	6	4.9	3.7	.0045		●	3	*	2	*	2	*	3		
M 5	0.8	70	8	25	6	4.9	4.2	.0050	*	●	3	*	2	*	2	*	3		
M 6	1	80	10	30	6	4.9	5	.0060	*	●	3	*	2	*	2	*	3		
M 8	1.25	90	14	35	8	6.2	6.8	.0080	*	●	3	*	2	*	2	*	3		
M 10	1.5	100	16	39	10	8	8.5	.0100	*	●	3	*	2	*	2	*	3		

### Reduced Shank

Reduced Shank								Tool Identification		C0603000		C0503200		C0503500	
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	l <sub>2</sub>	mm l <sub>3</sub>	ø d <sub>2</sub>	□	Dimens. ID	Enorm 2-VA-X	Flutes	Enorm 2-VA NE2	Flutes			Enorm 2-Z	Flutes
M 12	1.75	110	18	—	9	7	10.2	.0112	*	●	3			*	4
M 14	2	110	20	—	11	9	12	.0114	*	●	3			*	4
M 16	2	110	22	—	12	9	14	.0116	*	●	3			*	4
M 18	2.5	125	25	—	14	11	15.5	.0118		●	3			*	4
M 20	2.5	140	25	—	16	12	17.5	.0120	*	●	3			*	4
M 22	2.5	140	27	—	18	14.5	19.5	.0122		●	4			*	5
M 24	3	160	30	—	18	14.5	21	.0124		●	4			*	5
M 27	3	160	30	—	20	16	24	.0127		●	4				
M 30	3.5	180	35	—	22	18	26.5	.0130		●	4				
M 33	3.5	180	35	—	25	20	29.5	.0133							
M 36	4	200	40	—	28	22	32	.0136							
M 42	4.5	200	45	—	32	24	37.5	.0142							
M 45	4.5	220	45	—	36	29	40.5	.0145							
M 48	5	250	50	—	36	29	43	.0148							
M 52	5	250	50	—	40	32	47	.0152							

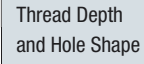


Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	
7G	ISO 2/6H	ISO 3/6G	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	
R45	R45	R45	R45	TIN	TIN	TIN	TICN	
C/2-3	E/1.5-2	E/1.5-2	E/1.5-2	C/2-3	E/1.5-2	E/1.5-2	C/2-3	
E/O/P	E/O/P	E/O/P	E/O	E/O/P	E/O/P	E/O	E/O/P	

max. 3 x d<sub>1</sub>



Class of Fit  
Coating  
Technical Characteristics



Thread Depth and Hole Shape

P 1.1-4.1	P 1.1-4.1	P 1.1-4.1	P 1.1-4.1	P 1.1-4.1	P 1.1-4.1	P 1.1-4.1	P 1.1-4.1	
M 1.1-2.1	M 1.1-2.1	M 1.1-2.1	M 1.1-2.1	M 1.1-3.1	M 1.1-3.1	M 1.1-3.1	M 1.1-3.1	
N 2.1	N 2.1	N 2.1	N 2.1	N 1.4-6	N 1.4-6	N 1.4-6	N 1.4-6	
				N 2.1-2, 2.4-5	N 2.1-2, 2.4-5	N 2.1-2, 2.4-5	N 2.1-2, 2.4-5	
				S 1.1	S 1.1	S 1.1	S 1.1	

Range of Application

B0503530		B0513500		B0513520		B0973500		B0503700		B0513700		B0973700		B0509400		Tool Identification		
Enorm 1-Z	Flutes	Enorm 1-Z/E	Flutes	Enorm 1-Z/E	Flutes	Enorm 1-Z/E-IKZ	Flutes	Enorm 1-Z TIN	Flutes	Enorm 1-Z/E TIN	Flutes	Enorm 1-Z/E-IKZ TIN	Flutes	Enorm 1-Z TICN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
																.0020	M 2	0.4
																.0025	M 2.5	0.45
*	3	*	3	*	3			*	3	●	3					.0030	M 3	0.5
																.0035	M 3.5	0.6
*	3	●	3	*	3			*	3	●	3			*	3	.0040	M 4	0.7
																.0045	M 4.5	0.75
*	3	●	3	*	3	*	3	*	3	●	3	*	3	*	3	.0050	M 5	0.8
																.0060	M 6	1
																.0080	M 8	1.25
																.0100	M 10	1.5

C0503530		C0513500		C0513520		C0973500		C0503700		C0513700		C0973700		C0509400		Tool Identification		
Enorm 2-Z	Flutes	Enorm 2-Z/E	Flutes	Enorm 2-Z/E	Flutes	Enorm 2-Z/E-IKZ	Flutes	Enorm 2-Z TIN	Flutes	Enorm 2-Z/E TIN	Flutes	Enorm 2-Z/E-IKZ TIN	Flutes	Enorm 2-Z TICN	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
*	4	*	4	*	4	*	4	*	4	●	4	*	4	*	4	.0112	M 12	1.75
																.0114	M 14	2
*	4	*	4	*	4	*	4	*	4	●	4	*	4	*	4	.0116	M 16	2
																.0118	M 18	2.5
																.0120	M 20	2.5
																.0122	M 22	2.5
																.0124	M 24	3
																.0127	M 27	3
																.0130	M 30	3.5
																.0133	M 33	3.5
																.0136	M 36	4
																.0142	M 42	4.5
																.0145	M 45	4.5
																.0148	M 48	5
																.0152	M 52	5

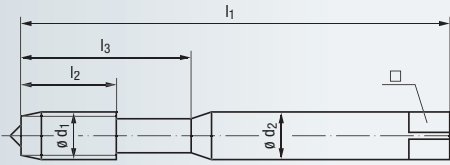
● = In stock    \* = Allow 7 days for delivery

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MP
- NPSM/NPSC
- NPSF
- R<sub>p</sub> (BSPP)
- G
- PT
- NPTF
- R<sub>c</sub> (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

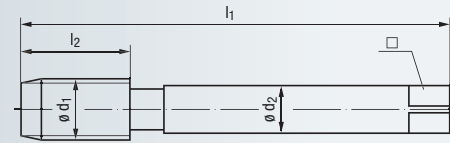


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

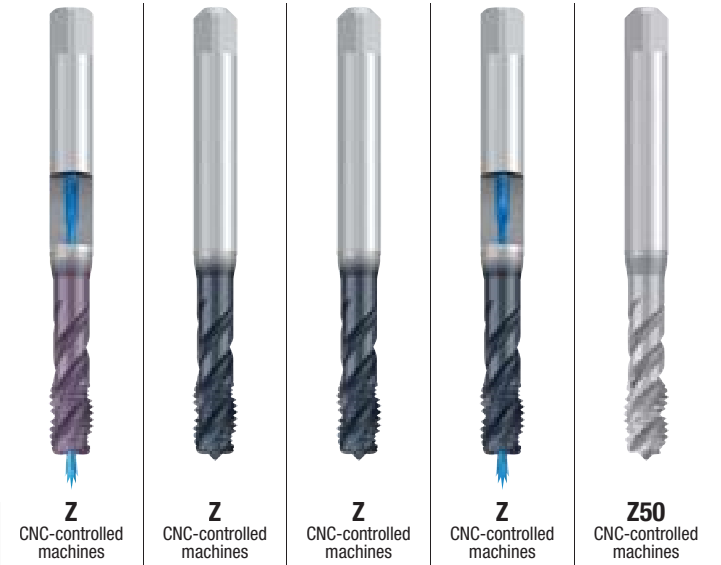
### DIN Length · DIN Shank



Reinforced Shank  
(M2 - M10)



Reduced Shank  
(M12 - M52)



**M**

**ISO Metric coarse thread  
DIN 13**

Class of Fit  
Coating  
Technical Characteristics  
Thread Depth and Hole Shape

ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	6HX
TICN	GLT-1	GLT-1	GLT-1	
R45	R45	R45	R45	<b>R50</b>
<b>E / 1.5-2</b>	C / 2-3	<b>E / 1.5-2</b>	C / 2-3	C / 2-3
E / O	E	E	E	E / O / P



Range of Application

P 1.1-4.1	P 1.1-4.1	P 1.1-4.1	P 1.1-4.1	P 1.1-4.1
M 1.1-3.1	M 1.1-3.1	M 1.1-3.1	M 1.1-3.1	M 1.1-2.1
N 1.4-6	N 1.4-6	N 1.4-6	N 1.4-6	N 2.1
N 2.1-2, 2.4-5	N 2.1-2, 2.4-5	N 2.1-2, 2.4-5	N 2.1-2, 2.4-5	
S 1.1	S 1.1	S 1.1	S 1.1	

### Reinforced Shank

Reinforced Shank								Tool Identification		B0979400		B050C400		B051C400		B099C400		B0653501	
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Image	Dimens. ID	Enorm 1-Z/E- IKZ TICN		Enorm 1-Z GLT-1		Enorm 1-Z/E GLT-1		Enorm 1-Z- IKZ GLT-1		Enorm 1-Z50	
			l <sub>2</sub>	l <sub>3</sub>	l <sub>3</sub>					Flutes	Flutes	Flutes	Flutes	Flutes	Flutes				
M 2	0.4	45	4	12	2.8	2.1	1.6	.0020											
M 2.5	0.45	50	5	14	2.8	2.1	2.05	.0025											
M 3	0.5	56	6	18	3.5	2.7	2.5	.0030					*	3			*	3	
M 3.5	0.6	56	7	20	4	3	2.9	.0035					*	3			*	3	
M 4	0.7	63	7	21	4.5	3.4	3.3	.0040					*	3			*	3	
M 4.5	0.75	70	8	25	6	4.9	3.7	.0045					*	3	*	3	*	3	
M 5	0.8	70	8	25	6	4.9	4.2	.0050	*	3	*	3	*	3	*	3	*	3	
M 6	1	80	10	30	6	4.9	5	.0060	*	3	*	3	*	3	*	3	*	3	
M 8	1.25	90	14	35	8	6.2	6.8	.0080	*	3	*	3	*	3	*	3	*	3	
M 10	1.5	100	16	39	10	8	8.5	.0100	*	3	*	3	*	3	*	3	*	3	

### Reduced Shank

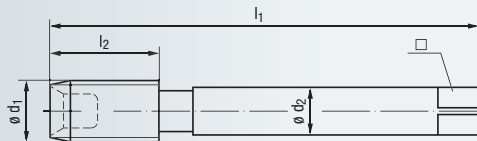
Reduced Shank								Tool Identification		C0979400		C050C400		C051C400		C099C400		C0653501	
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Image	Dimens. ID	Enorm 2-Z/E- IKZ TICN		Enorm 2-Z GLT-1		Enorm 2-Z/E GLT-1		Enorm 2-Z- IKZ GLT-1		Enorm 2-Z50	
			l <sub>2</sub>	l <sub>3</sub>	l <sub>3</sub>					Flutes	Flutes	Flutes	Flutes	Flutes	Flutes				
M 12	1.75	110	18	—	9	7	10.2	.0112	*	4	*	4	*	4	*	4	*	4	
M 14	2	110	20	—	11	9	12	.0114	*	4	*	4	*	4	*	4	*	4	
M 16	2	110	22	—	12	9	14	.0116	*	4	*	4	*	4	*	4	*	4	
M 18	2.5	125	25	—	14	11	15.5	.0118	*	4	*	4	*	4	*	4	*	4	
M 20	2.5	140	25	—	16	12	17.5	.0120	*	4	*	4	*	4	*	4	*	4	
M 22	2.5	140	27	—	18	14.5	19.5	.0122	*	4	*	4	*	4	*	4	*	4	
M 24	3	160	30	—	18	14.5	21	.0124	*	5									
M 27	3	160	30	—	20	16	24	.0127											
M 30	3.5	180	35	—	22	18	26.5	.0130											
M 33	3.5	180	35	—	25	20	29.5	.0133											
M 36	4	200	40	—	28	22	32	.0136											
M 42	4.5	200	45	—	32	24	37.5	.0142											
M 45	4.5	220	45	—	36	29	40.5	.0145											
M 48	5	250	50	—	36	29	43	.0148											
M 52	5	250	50	—	40	32	47	.0152											



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK

### DIN Length • DIN Shank

With internal chip collector



Reduced Shank



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials

# M



**ISO Metric coarse thread  
DIN 13**

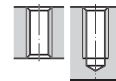
Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application

6HX	6HX
NE2	TIN
C / 2-3	C / 2-3
P / 0 <sup>1)</sup>	P / 0 <sup>1)</sup>

max. 1.5 x d<sub>1</sub>



<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>
<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>

### Reduced Shank

Reduced Shank							Tool Identification		C0803001		C0803101	
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm l <sub>2</sub>	ø d <sub>2</sub>	□		Dimens. ID	Robust 2X-VA	Flutes	Robust 2X-VA TIN	Flutes	
M 20	2.5	140	32	16	12	17.5	.0120	★	5			
M 22	2.5	140	32	18	14.5	19.5	.0122	★	5	upon		
M 24	3	160	34	18	14.5	21	.0124	★	5			
M 27	3	160	36	20	16	24	.0127	★	5	request		
M 30	3.5	180	40	22	18	26.5	.0130	★	6			
M 33	3.5	180	40	25	20	29.5	.0133	★	6			
M 36	4	200	50	28	22	32	.0136	★	6			
M 42	4.5	200	56	32	24	37.5	.0142	★	6			
M 45	4.5	220	58	36	29	40.5	.0145	★	6			
M 48	5	250	65	36	29	43	.0148	★	6			
M 52	5	250	65	40	32	47	.0152	★	6			
M 56	5.5	250	70	40	32	50.5	.0156	★	7			
M 60	5.5	280	70	45	35	54.5	.0160	★	7			
M 64	6	315	75	50	39	58	.0164	★	7			
M 68	6	315	75	50	39	62	.0168	★	7			

≥ M56 Shank with grooves for better handling!

<sup>1)</sup> If possible, use paste lubrication, coating both the tool and the walls of the drilled hole.  
Lubrication with oil is possible only in the vertical machining of blind holes, if the hole is entirely filled with oil.

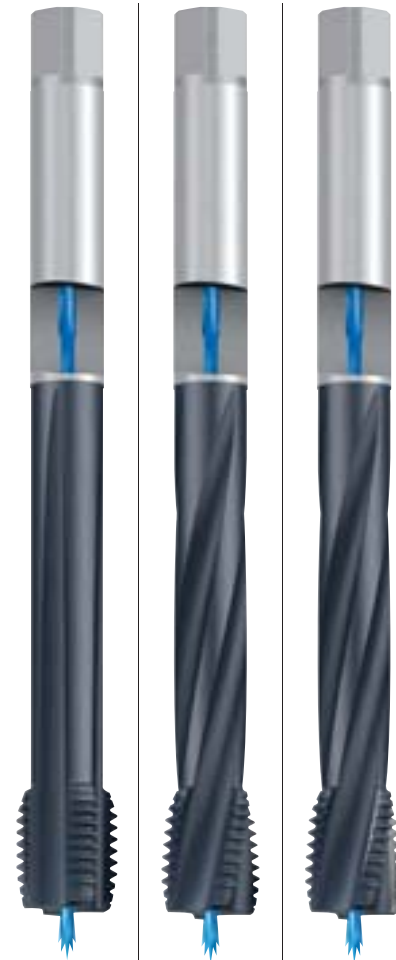
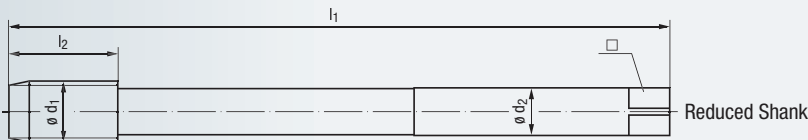
Larger sizes priced upon request.

### The Complete Tool System

Robust 2X-VA Taps when used with a KSN Type tapping attachment creates the optimal tapping unit!

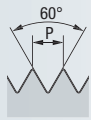
**Extra Length · DIN Shank**

With long flutes



**Z** CNC-controlled machines  
**Z** CNC-controlled machines  
**Z** CNC-controlled machines

**M**  
ISO Metric coarse thread  
DIN 13



Class of Fit  
Coating  
Technical Characteristics

6HX	6HX	6HX
GLT-1	GLT-1	GLT-1
C / 2-3	R15	<b>BF</b> R15
E / O	C / 2-3	C / 2-3
E / O	E / O	E / O

Thread Depth and Hole Shape



Range of Application

<b>P 2.1-5.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>
<b>K 1.1-4.2</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>
<b>N 1.4-6, 2.4-7</b>	<b>K 2.1</b>	<b>K 2.1</b>
<b>N 4.1</b>	<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-6, 2.4-5</b>

**Reduced Shank**

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm l <sub>2</sub>	ø d <sub>2</sub>	□	Tool Identification		C053C401		C428C401		C406C401	
						Tool	Dimens. ID	Rekord 2A-Z IKZ-LF4 GLT-1	Flutes	Rekord 2D-Z IKZ-LF4 GLT-1	Flutes	Rekord 2D-Z-BF IKZ-LF4 GLT-1	Flutes
M 20	2.5	190	25	16	12	17.5	.0120	★	4	★	3	★	3
M 24	3	240	30	18	14.5	21	.0124	★	4	★	3	★	3
M 30	3.5	270	35	22	18	26.5	.0130	★	4	★	4	★	4
M 33	3.5	290	35	25	20	29.5	.0133	★	4	★	4	★	4
M 36	4	310	40	28	22	32	.0136	★	4	★	4	★	4
M 42	4.5	340	45	32	24	37.5	.0142	★	4	★	4	★	4
M 45	4.5	360	45	36	29	40.5	.0145	★	4	★	4	★	4

1) Threading in through holes is possible only with external cooling/lubrication

Product Finder

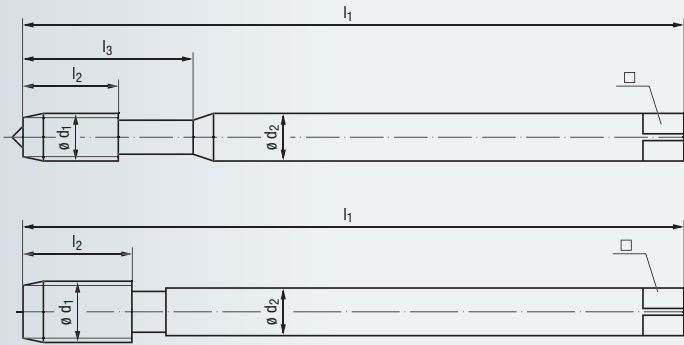
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- R<sub>p</sub> (BSPP)
- G
- NPT
- NPTF
- R<sub>c</sub> (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



- Product Finder
- Vc
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### Extra Length • DIN Shank

#### With extra long shank



Reinforced Shank (M3 - M8)

Reduced Shank (M6 - M20)



**H**  
Materials of high tensile strength

**STEEL**  
Steel materials

**VA**  
Stainless steel materials

**VA**  
Stainless steel materials

# M



ISO Metric coarse thread  
DIN 13

Class of Fit  
Coating  
Technical Characteristics



Thread Depth and Hole Shape

Range of Application

6HX	ISO 2/6H	ISO 2/6H	ISO 2/6H
NT		NT	
C / 2-3	B / 4-5	B / 4-5	R15
E / O / P	E / O	E / O / P	<b>E / 1.5-2</b>
			E / O / P
max. 2 x d <sub>1</sub>	max. 3 x d <sub>1</sub>		max. 2 x d <sub>1</sub>
<b>P 2.1-4.1</b>	<b>P 1.1-2.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>
<b>K 1.1-4.2</b>	<b>N 2.2</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>
<b>N 2.4-7</b>		<b>K 2.1</b>	<b>K 2.1</b>
<b>N 4.1, 5.1</b>		<b>N 1.5, 2.4-5</b>	<b>N 2.4-5</b>

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm		ø d <sub>2</sub>	□	Tool Identification		B2100501		B2201000		B2203000		B2463000	
			l <sub>2</sub>	l <sub>3</sub>			Rekord 1A-H-LS	Flutes	Rekord 1B-STEEL-LS	Flutes	Rekord 1B-VA-LS	Flutes	Rekord 1D-VA/E-LS	Flutes		
M 3	0.5	100	11	18	3.5	2.7	2.5	.0030	★	3	★	3	★	3	★	3
M 4	0.7	125	13	21	4.5	3.4	3.3	.0040	★	3	★	3	★	3	★	3
M 5	0.8	140	15	25	6	4.9	4.2	.0050	★	3	★	3	★	3	●	3
M 6	1	160	17	30	6	4.9	5	.0060	★	3	★	3	★	3	●	3
M 8	1.25	180	20	35	8	6.2	6.8	.0080	★	3	★	3	★	3	●	3

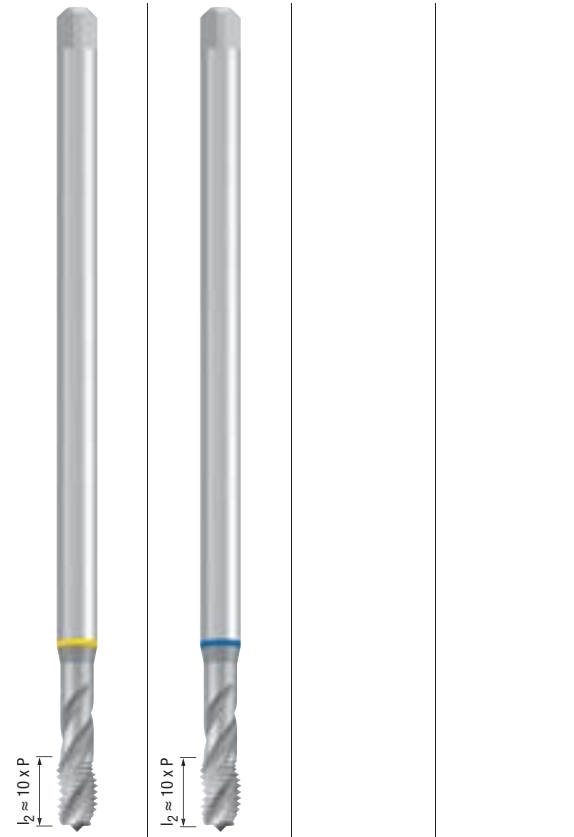
### Reduced Shank

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm		ø d <sub>2</sub>	□	Tool Identification		C2100501		C2201000		C2203000		C2463000	
			l <sub>2</sub>	l <sub>3</sub>			Rekord 2A-H-LS	Flutes	Rekord 2B-STEEL-LS	Flutes	Rekord 2B-VA-LS	Flutes	Rekord 2D-VA/E-LS	Flutes		
M 6	1	160	17	—	4.5	3.4	5	.0060	★	3	★	3	★	3	★	3
M 8	1.25	180	20	—	6	4.9	6.8	.0080	★	3	★	3	★	3	★	3
M 10	1.5	200	22	—	7	5.5	8.5	.0100	★	3	★	3	★	3	★	3
M 12	1.75	224	24	—	9	7	10.2	.0112	★	3	★	3	★	3	★	3
M 14	2	224	26	—	11	9	12	.0114	★	3	★	3	★	3	★	3
M 16	2	224	27	—	12	9	14	.0116	★	3	★	3	★	3	★	3
M 18	2.5	250	30	—	14	11	15.5	.0118	★	4	★	3	★	3	★	3
M 20	2.5	280	32	—	16	12	17.5	.0120	★	4	★	3	★	3	★	3

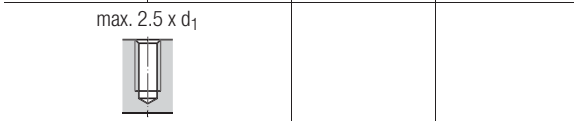
1) From M5 also available with IKZ (axial coolant thru)

2) From M5 also available with IKZN (axial coolant thru with radial flow into the flutes)

As a further alternative to our compact types LS we can offer you our special shank extensions without and with coolant-thru (IKZ) for standard taps (see pages 116-119).



STEEL Steel materials	VA Stainless steel materials
ISO 2/6H	ISO 2/6H
R35	R35
C / 2-3	C / 2-3
E / O	E / O / P



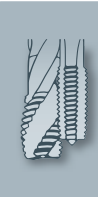
P 1.1-2.1	P 1.1-3.1
N 2.2	M 1.1-2.1
	K 2.1

B2501000		B2503000	
Enorm 1-STEEL-LS	Flutes	Enorm 1-VA-LS	Flutes
1)		1)	
★	3	★	3
★	3	★	3
★	3	★	3
★	3	★	3
★	3	★	3

C2501000		C2503000	
Enorm 2-STEEL-LS	Flutes	Enorm 2-VA-LS	Flutes
1)		1)	
★	3	★	3
★	3	★	3
★	3	★	3
★	3	★	3
★	3	★	3
★	3	★	3

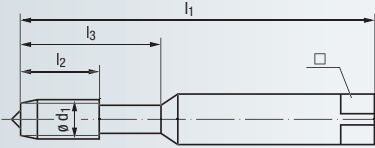


- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

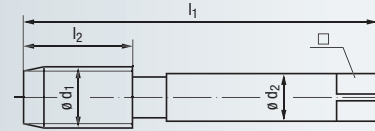


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### ANSI Length · ANSI Shank



Reinforced Shank (M4 - M10)



Reduced Shank (M12 - M24)



**H**  
Materials of high tensile strength



**H**  
Materials of high tensile strength



**STEEL**  
Steel materials



**VA**  
Stainless steel materials



**STEEL**  
Steel materials

**M**

**ISO Metric coarse thread  
DIN 13**

Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application

6HX	6HX	ISO 2/6H	ISO 2/6H	ISO 2/6H
NT	TIN	TIN	NT	TIN
<b>E / 1.5-2</b>	<b>E / 1.5-2</b>	B / 4-5	B / 4-5	C / 2-3
E / O / P	E / O / P	E / O	E / O / P	E / O
max. 2 x d <sub>1</sub>		max. 3 x d <sub>1</sub>		max. 2 x d <sub>1</sub>
<b>P 2.1-4.1</b>	<b>P 2.1-5.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-4.1</b>
<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>	<b>M 1.1-3.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-3.1</b>
<b>N 2.4-7</b>	<b>N 2.4-7, 4.1</b>	<b>K 2.1-2.2</b>	<b>K 2.1</b>	<b>K 2.1-2.2</b>
<b>N 4.1, 5.1</b>		<b>N 2.2, 2.4-5</b>	<b>N 1.5, 2.4-5</b>	<b>N 1.4-5</b>
				<b>N 2.2, 2.4-5</b>

Nominal Size		P		inch				Flutes	Tool Identification		AU110501		AU110601		AU201400		AU203000		AU461400	
Ø d <sub>1</sub>	mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	Ø d <sub>2</sub>	□	Rekord A-H/E		Flutes	Rekord A-H/E TIN	Flutes	Rekord B-STEEL TIN	Flutes	Rekord B-VA	Flutes	Rekord D-STEEL/E TIN	Flutes			
M 4	0.7	2 1/8	2.13	0.512	0.827	0.168	0.131	3.3	.0040	●	3	●	3	●	3	●	3	●	3	
M 5	0.8	2 3/8	2.38	0.591	0.945	0.194	0.152	4.2	.0050	●	3	●	3	●	3	●	3	●	3	
M 6	1	2 1/2	2.50	0.669	1.142	0.255	0.191	5	.0060	●	3	●	3	●	3	●	3	●	3	
M 8	1.25	2 23/32	2.72	0.787	1.299	0.318	0.238	6.8	.0080	●	3	●	3	●	3	●	3	●	3	
M 10	1.5	2 15/16	2.94	0.866	1.378	0.381	0.286	8.5	.0100	●	3	●	3	●	3	●	3	●	3	
M 12	1.75	3 3/8	3.38	0.984	—	0.367	0.275	10.2	.0112	●	3	●	3	●	3	●	3	●	3	
M 14	2	3 19/32	3.59	1.024	—	0.429	0.322	12	.0114	●	3	●	3	●	3	●	3	●	3	
M 16	2	3 13/16	3.81	1.063	—	0.480	0.360	14	.0116	●	3	●	3	●	3	●	3	●	3	
M 20	2.5	4 15/32	4.47	1.181	—	0.652	0.489	17.5	.0120	●	4	●	4	●	3	●	3	●	3	
M 24	3	4 29/32	4.91	1.339	—	0.760	0.570	21	.0124	●	4	●	4	●	3	●	3	●	3	

Drill or countersink diameters are in mm!



VA Stainless steel materials		STEEL Steel materials		VA Stainless steel materials		Z CNC-controlled machines												
ISO 2/6H		ISO 2/6H		ISO 2/6H		ISO 2/6H										Class of Fit		
R15		R35		R35		R45										Coating		
E / 1.5-2		C / 2-3		C / 2-3		E / 1.5-2										Technical Characteristics		
E / O / P		E / O		E / O / P		E / O / P												
max. 2 x d <sub>1</sub>		max. 2.5 x d <sub>1</sub>		max. 2.5 x d <sub>1</sub>		max. 3 x d <sub>1</sub>										Thread Depth and Hole Shape		
																Range of Application		
P 1.1-3.1		P 1.1-4.1		P 1.1-3.1		P 1.1-4.1												
M 1.1-2.1		M 1.1-3.1		M 1.1-2.1		M 1.1-3.1												
K 2.1		K 2.1-2.2		K 2.1		N 1.4-6												
N 2.4-5		N 2.2, 2.4-5				N 2.1-2, 2.4-5												
						S 1.1												
AU463000		AU501400		AU503000		AU513700										Tool Identification		
Rekod D-VA/E	Flutes	Enorm STEEL TIN	Flutes	Enorm VA	Flutes	Enorm Z/E TIN	Flutes									Dimens. ID	Nominal Size ø d <sub>1</sub>	P mm
●	3	●	3	●	3											.0040	M 4	0.7
●	3	●	3	●	3	●	3									.0050	M 5	0.8
●	3	●	3	●	3	●	3									.0060	M 6	1
●	3	●	3	●	3	●	3									.0080	M 8	1.25
●	3	●	3	●	3	●	3									.0100	M 10	1.5
●	3	●	3	●	3	●	4									.0112	M 12	1.75
●	3	●	3	●	3											.0114	M 14	2
●	3	●	3	●	3											.0116	M 16	2
		●	3	●	3											.0120	M 20	2.5
		●	4	●	4											.0124	M 24	3

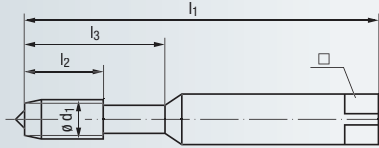
- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- RPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



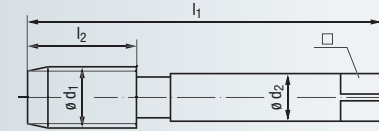
● = In stock

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



Reinforced Shank  
(M4 - M6)



Reduced Shank  
(M8 - M24)



**STEEL**  
Steel materials



**STEEL**  
Steel materials



**STEEL**  
Steel materials



**MS**  
Copper-zinc alloys



**MS**  
Copper-zinc alloys

**M**

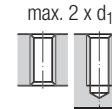
**ISO Metric coarse thread  
DIN 13**

Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application

6HX	6HX	6HX	6HX	<b>6GX</b>
	<b>LH</b>			
C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3
E / 0	E / 0	E / 0	E / 0	E / 0



P 1.1-2.1 N 2.3	P 1.1-2.1 N 2.3	P 1.1-2.1 N 2.3	N 2.3	N 2.3
--------------------	--------------------	--------------------	-------	-------

								Tool Identification		A0101001		A0101051		A0121001		A0102501		A0102521		
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm				ø d <sub>2</sub>	□		Dimens. ID	Rekord A-STEEL	Flutes	Rekord A-STEEL-LH	Flutes	Rekord A-STEEL-AZ	Flutes	Rekord A-MS	Flutes	Rekord A-MS	Flutes
			M 4	0.7	45	12					22	4.5	3.4	3.3	.0040	*	3	*	3	3
M 5	0.8	50	14	25	6	4.9	4.2	.0050	*	3	*	3	3	*	3	*	3	*	3	
M 6	1	56	16	28	6	4.9	5	.0060	*	3	*	3	3	*	3	*	3	*	3	
M 8	1.25	63	20	-	6	4.9	6.8	.0080	*	3	*	3	3	*	3	*	3	*	3	
M 10	1.5	70	22	-	7	5.5	8.5	.0100	*	3	*	3	3	*	3	*	3	*	3	
M 12	1.75	75	24	-	9	7	10.2	.0112	*	3	*	3	3	*	3					
M 14	2	80	26	-	11	9	12	.0114	*	3										
M 16	2	80	27	-	12	9	14	.0116	*	3	*	3	*	3						
M 20	2.5	95	32	-	16	12	17.5	.0120	*	4	*	4								
M 24	3	110	34	-	18	14.5	21	.0124	*	4	*	4								

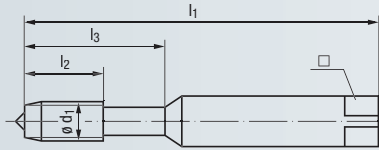
STEEL Steel materials		STEEL Steel materials		VA Stainless steel materials		VA Stainless steel materials		STEEL Steel materials		VA Stainless steel materials								
ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H					Class of Fit		
		NT	NT					R15	R15							Coating		
B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / 4-5	C / 2-3	C / 2-3	E / 1.5-2	E / 1.5-2					Technical Characteristics		
E / 0	E / 0	E / 0 / P	E / 0 / P	E / 0 / P	E / 0 / P	E / 0 / P	E / 0 / P	E / 0	E / 0	E / 0 / P	E / 0 / P							
max. 3 x d <sub>1</sub>						max. 2 x d <sub>1</sub>										Thread Depth and Hole Shape		
																Range of Application		
P 1.1-2.1	P 1.1-2.1	P 1.1-3.1	P 1.1-3.1	P 1.1-2.1	P 1.1-2.1	P 1.1-3.1	P 1.1-3.1	P 1.1-2.1	P 1.1-2.1	P 1.1-3.1	P 1.1-3.1							
N 2.2	N 2.2	M 1.1-2.1	M 1.1-2.1	N 2.2	N 2.2	K 2.1	K 2.1	N 2.2	N 2.2	M 1.1-2.1	M 1.1-2.1							
		N 1.5, 2.4-5	N 1.5, 2.4-5			N 1.5, 2.4-5	N 1.5, 2.4-5			N 2.4-5	N 2.4-5							
A0201000		A0221000		A0203000		A0223000		A0451000		A0463000						Tool Identification		
Rekord B-STEEL	Flutes	Rekord B-STEEL-AZ	Flutes	Rekord B-VA	Flutes	Rekord B-VA-AZ	Flutes	Rekord D-STEEL	Flutes	Rekord D-VA/E	Flutes					Dimens. ID	Nominal Size ø d <sub>1</sub>	P
★	3	★	3	★	3	★	3	★	3	★	3					.0040	M 4	0.7
★	3	★	3	★	3	★	3	★	3	★	3					.0050	M 5	0.8
★	3	★	3	★	3	★	3	★	3	★	3					.0060	M 6	1
★	3	★	3	★	3	★	3	★	3	★	3					.0080	M 8	1.25
★	3	★	3	★	3	★	3	★	3	★	3					.0100	M 10	1.5
★	3	★	3	★	3	★	3	★	3	★	3					.0112	M 12	1.75
★	3	★	3	★	3	★	3	★	3	★	3					.0114	M 14	2
★	3	★	3	★	3	★	3	★	3	★	3					.0116	M 16	2
★	3							★	3							.0120	M 20	2.5
★	3															.0124	M 24	3

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

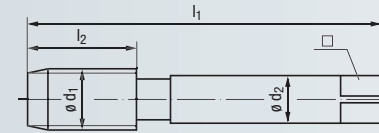


- Product Finder
- Vc
- UNC
- UNF
- UNEF
- UN-8
- M**
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



Reinforced Shank  
(M4 - M6)



Reduced Shank  
(M8 - M24)



**STEEL**  
Steel materials



**STEEL**  
Steel materials



**Z**  
CNC-controlled machines

**M**

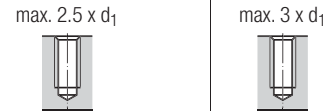
**ISO Metric coarse thread  
DIN 13**

Class of Fit: **ISO 2/6H**  
Coating: **R35**  
Technical Characteristics: **C / 2-3**

Thread Depth and Hole Shape

Range of Application

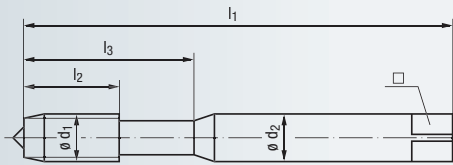
<b>ISO 2/6H</b>	<b>ISO 3/6G</b>	<b>ISO 2/6H</b>
<b>R35</b>	<b>R35</b>	<b>R45</b>
<b>C / 2-3</b>	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>
<b>E / 0</b>	<b>E / 0</b>	<b>E / 0 / P</b>



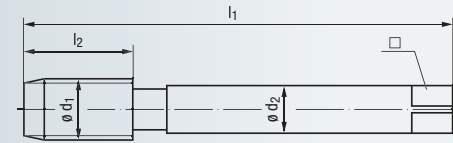
<b>P 1.1-2.1</b>	<b>P 1.1-2.1</b>	<b>P 1.1-4.1</b>
<b>N 2.2</b>	<b>N 2.2</b>	<b>M 1.1-2.1</b>
		<b>N 2.1</b>

								Tool Identification		A0501000		A0511020		A0513500				
Nominal Size Ø d <sub>1</sub>	P	l <sub>1</sub>	mm				Ø d <sub>2</sub>	□		Dimens. ID	Enorm STEEL	Flutes	Enorm STEEL/E	Flutes	Enorm Z/E	Flutes		
			l <sub>2</sub>	l <sub>3</sub>														
M 4	0.7	45	7	22	4.5	3.4	3.3		<b>.0040</b>	★	3	★	3	★	3			
M 5	0.8	50	9	25	6	4.9	4.2		<b>.0050</b>	★	3	★	3	★	3			
M 6	1	56	10	28	6	4.9	5		<b>.0060</b>	★	3	★	3	★	3			
M 8	1.25	63	14	—	6	4.9	6.8		<b>.0080</b>	★	3	★	3	★	3			
M 10	1.5	70	16	—	7	5.5	8.5		<b>.0100</b>	★	3	★	3	★	3			
M 12	1.75	75	18	—	9	7	10.2		<b>.0112</b>	★	3	★	3	★	4			
M 14	2	80	20	—	11	9	12		<b>.0114</b>	★	3			★	4			
M 16	2	80	22	—	12	9	14		<b>.0116</b>	★	3	★	3	★	4			
M 20	2.5	95	25	—	16	12	17.5		<b>.0120</b>	★	3			★	4			
M 24	3	110	30	—	18	14.5	21		<b>.0124</b>	★	4			★	5			

**DIN Length • DIN Shank**

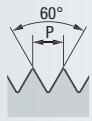


Reinforced Shank  
(M3x0.35 - M10x1.25)



Reduced Shank  
(M8x1 - M30x2)

**MF**



ISO Metric fine thread  
DIN 13

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

Range of Application



STEEL Steel materials	STEEL Steel materials	MG Magnesium alloys	H Materials of high tensile strength	H Materials of high tensile strength
6HX	6HX	6HX	6HX	6HX
	LH			
C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3
E / O	E / O	E / O / A	E / O / P	E / O
		max. 2 x d <sub>1</sub>		max. 2 x d <sub>1</sub>
		1)		
P 1.1-2.1 N 2.3	P 1.1-2.1 N 2.3	N 3.1-2	P 2.1-4.1 K 1.1-4.2 N 2.4-7 N 4.1, 5.1	P 2.1-4.1 K 1.1-4.2 N 2.4-7 N 4.1, 5.1

**Reinforced Shank**

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification		B0101001		B0101051		B0100501		
			l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>			Rekord 1A-STEEL	Flutes	Rekord 1A-STEEL-LH	Flutes	Rekord 1A-H	Flutes			
M 3 x 0.35		56	8	18	3.5	2.7	2.65	.0202	★	3	★	3			★	3
M 4 x 0.5		63	10	21	4.5	3.4	3.5	.0210	★	3	★	3			★	3
M 5 x 0.5		70	11	25	6	4.9	4.5	.0218	★	3	★	3			★	3
M 6 x 0.75		80	13	30	6	4.9	5.2	.0229	★	3	★	3			★	3
M 8 x 0.75		80	14	30	8	6.2	7.2	.0250	★	3						
M 8 x 1		90	17	35	8	6.2	7	.0251	★	3	★	3				
M 10 x 1		90	18	35	10	8	9	.0276	★	4	★	4				
M 10 x 1.25		100	18	39	10	8	8.8	.0277	★	3						

**Reduced Shank**

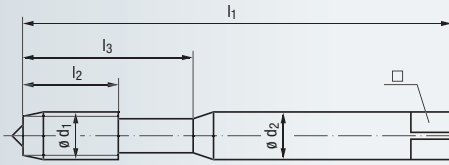
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification		C0101001		C010J601		C0100501		C1950501	
			l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>			Rekord 2A-STEEL	Flutes	Rekord 2A-MG GLT-1	Flutes	Rekord 2A-H	Flutes	Rekord 2A-H-IKZ	Flutes		
M 8 x 1		90	17	—	6	4.9	7	.0251	★	3		★	3	●	3		
M 10 x 1		90	18	—	7	5.5	9	.0276	★	4		★	4	●	4		
M 10 x 1.25		100	22	—	7	5.5	8.8	.0277	★	3							
M 12 x 1.5		100	22	—	9	7	10.5	.0303	★	4		★	4	●	4	★	4
M 14 x 1.5		100	22	—	11	9	12.5	.0331	★	4		★	4	●	4	★	4
M 16 x 1.5		100	22	—	12	9	14.5	.0359	★	4		★	4	●	4	★	4
M 18 x 1.5		110	25	—	14	11	16.5	.0390	★	4				●	4		
M 20 x 1.5		125	25	—	16	12	18.5	.0422	★	4				●	4	★	4
M 22 x 1.5		125	25	—	18	14.5	20.5	.0438	★	4							
M 22 x 2		140	27	—	18	14.5	20	.0439	★	4							
M 24 x 1.5		140	27	—	18	14.5	22.5	.0452	★	4							
M 24 x 2		140	27	—	18	14.5	22.5	.0453	★	4							
M 27 x 1.5		140	28	—	20	16	25.5	.0470	★	5							
M 27 x 2		140	28	—	20	16	25	.0471	★	4							
M 30 x 1.5		150	28	—	22	18	28.5	.0490	★	5							
M 30 x 2		150	28	—	22	18	28	.0491	★	4							

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

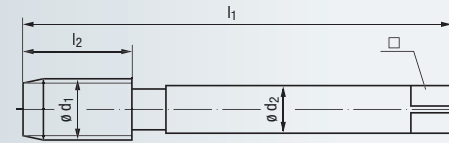


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF**
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

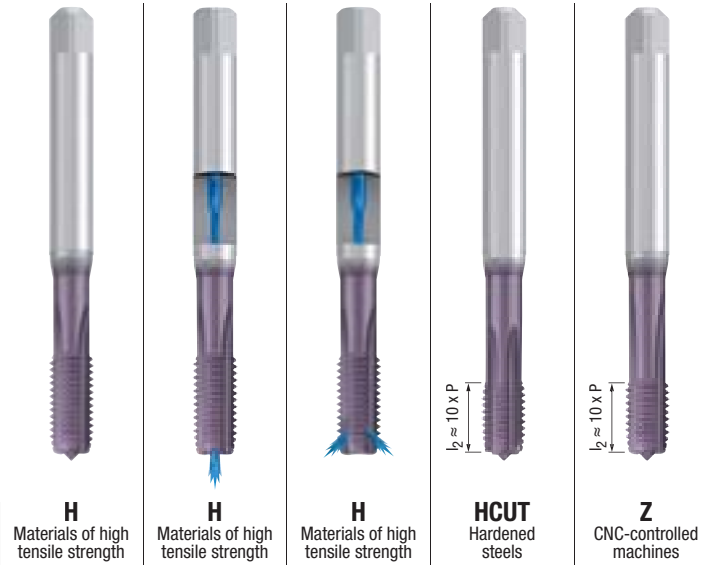
### DIN Length · DIN Shank



Reinforced Shank  
(M3x0.35 - M10x1.25)



Reduced Shank  
(M8x1 - M30x2)



**H** Materials of high tensile strength  
**H** Materials of high tensile strength  
**H** Materials of high tensile strength  
**HCUT** Hardened steels  
**Z** CNC-controlled machines



**ISO Metric fine thread  
DIN 13**

Class of Fit: 6HX  
 Coating: TiCN  
 Technical Characteristics: C/2-3, E/O/P  
 Thread Depth and Hole Shape: max. 2 x d<sub>1</sub>

Range of Application

6HX	6HX	6HX	6HX	6HX
TiCN	TiCN	TiCN	TiCN	TiCN
C/2-3	C/2-3	C/2-3	<b>HSSE-PM</b>	C/2-3
E/O/P	E/O	E/O	O/P	E/O/P
max. 2 x d <sub>1</sub>	max. 2 x d <sub>1</sub>	max. 2 x d <sub>1</sub>	max. 1.5 x d <sub>1</sub>	max. 2 x d <sub>1</sub>
P 2.1-5.1 K 1.1-4.2 N 2.4-7,4.1	P 2.1-5.1 K 1.1-4.2 N 2.4-7,4.1	P 2.1-5.1 K 1.1-4.2 N 2.4-7,4.1	H 1.1-2	P 2.1-5.1 K 1.1-4.2 N 1.4-6,2.4-7 N 4.1

### Reinforced Shank

Nominal Size								Tool Identification		B010J901	
Size	P	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	Ø d <sub>2</sub>	Ø d <sub>1</sub>	□	Rekord 1A-HCUT TiCN <sup>2)</sup>	Flutes		
M 3 x 0.35	56	8	18	3.5	2.7	2.65	.0202				
M 4 x 0.5	63	10	21	4.5	3.4	3.5	.0210				
M 5 x 0.5	70	11	25	6	4.9	4.5	.0218				
M 6 x 0.75	80	13	30	6	4.9	5.2	.0229				
M 8 x 0.75	80	14	30	8	6.2	7.2	.0250				
M 8 x 1	90	17	35	8	6.2	7	.0251			*	5
M 10 x 1	90	18	35	10	8	9	.0276			*	5
M 10 x 1.25	100	18	39	10	8	8.8	.0277				

### Reduced Shank

Nominal Size								Tool Identification		C0109101		C1959101		C1069101		C010J901		C0109401	
Size	P	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	Ø d <sub>2</sub>	Ø d <sub>1</sub>	□	Rekord 2A-H TiCN	Flutes	Rekord 2A-H-TiCN	Flutes	Rekord 2A-H-TiCN	Flutes	Rekord 2A-HCUT TiCN <sup>2)</sup>	Flutes	Rekord 2A-Z TiCN	Flutes		
M 8 x 1	90	17	—	6	4.9	7	.0251	*	3							*	3		
M 10 x 1	90	18	—	7	5.5	9	.0276	*	4							*	4		
M 10 x 1.25	100	22	—	7	5.5	8.8	.0277	*	3							*	4		
M 12 x 1.5	100	22	—	9	7	10.5	.0303	*	4	*	4	*	4	*	5	*	4		
M 14 x 1.5	100	22	—	11	9	12.5	.0331	*	4	*	4	*	4	*	6	*	4		
M 16 x 1.5	100	22	—	12	9	14.5	.0359	*	4	*	4	*	4	*	6	*	4		
M 18 x 1.5	110	25	—	14	11	16.5	.0390	*	4										
M 20 x 1.5	125	25	—	16	12	18.5	.0422	*	4	*	4	*	4						
M 22 x 1.5	125	25	—	18	14.5	20.5	.0438	*	4										
M 22 x 2	140	27	—	18	14.5	20	.0439												
M 24 x 1.5	140	27	—	18	14.5	22.5	.0452	*	4										
M 24 x 2	140	27	—	18	14.5	22	.0453												
M 27 x 1.5	140	28	—	20	16	25.5	.0470												
M 27 x 2	140	28	—	20	16	25	.0471												
M 30 x 1.5	150	28	—	22	18	28.5	.0490												
M 30 x 2	150	28	—	22	18	28	.0491												

1) Threading in through holes is possible only with external cooling/lubrication  
 2) Increase drill diameter for taps Rekord 1/2A-HCUT-TiCN by 0.1 mm

<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>SPEED</b> High-speed cutting	<b>SPEED</b> High-speed cutting	<b>SPEED</b> High-speed cutting	<b>SPEED</b> High-speed cutting	<b>Z-OKO</b> Dry machining and MQL	<b>H</b> Materials of high tensile strength	
6HX TICN	6HX TICN	6HX TICN	6HX TICN	6HX TICN	6HX TICN	6HX TICN	6HX <b>Carbide</b>	Class of Fit Coating Technical Characteristics
C / 2-3 E / O	C / 2-3 E / O	C / 2-3 E / O	C / 2-3 E / O	<b>E / 1.5-2</b> E / O	C / 2-3 E / O	C / 2-3 E / M / A	C / 2-3 E / O	
max. 2 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 		max. 2 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 	max. 2 x d <sub>1</sub> 	Thread Depth and Hole Shape
<b>P 2.1-5.1</b> <b>K 1.1-4.2</b> <b>N 1.4-6, 2.4-7</b> <b>N 4.1</b>	<b>P 2.1-5.1</b> <b>K 1.1-4.2</b> <b>N 1.4-6, 2.4-7</b> <b>N 4.1</b>	<b>K 1.1-4.2</b> <b>N 1.4-6</b> <b>N 2.3, 2.6</b>	<b>K 1.1-4.2</b> <b>N 1.4-6</b> <b>N 2.3, 2.6</b>	<b>K 1.1-4.2</b> <b>N 1.4-6</b> <b>N 2.3, 2.6</b>	<b>K 1.1-4.2</b> <b>N 1.4-6</b> <b>N 2.3, 2.6</b>	<b>P 2.1-5.1</b> <b>K 1.1-4.2</b> <b>N 1.4-6, 2.6-7</b> <b>N 4.1</b>	<b>P 5.1</b> <b>K 1.1-4.2</b> <b>N 1.5-6, 2.6-8</b> <b>N 5.1-2</b> <b>H 1.1-2</b>	Range of Application

							B1950901		Tool Identification		
							VHM Rekord 1A-H-IKZ	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
									.0202	M 3 x 0.35	
									.0210	M 4 x 0.5	
									.0218	M 5 x 0.5	
									.0229	M 6 x 0.75	
									.0250	M 8 x 0.75	
							*	3	.0251	M 8 x 1	
							*	4	.0276	M 10 x 1	
							*	3	.0277	M 10 x 1.25	

C1959401		C1069401		C3109401		C3159401		C3169401		C3179401		C4109401		C1950901		Tool Identification		
Rekord 2A-Z-IKZ TICN	Flutes	Rekord 2A-Z-IKZN TICN	Flutes	Rekord 2A-SPEED TICN	Flutes	Rekord 2A-SPEED IKZ-TICN	Flutes	Rekord 2A-SPEED/E IKZ-TICN	Flutes	Rekord 2A-SPEED IKZN-TICN	Flutes	Rekord 2A-Z-OKO TICN	Flutes	VHM/KHM Rekord 2A-H-IKZ	Flutes	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
*	3	*	3	*	3	*	3			*	3	●	3			.0251	M 8 x 1	
●	4	*	4	*	4	*	4			*	4	●	4			.0276	M 10 x 1	
●	4	*	4	*	4	●	4			*	4	●	4			.0277	M 10 x 1.25	
*	4	*	4	*	4	*	4	*	4	*	4	●	4	*	4	.0303	M 12 x 1.5	
*	4	*	4	*	4	●	4	*	4	*	4	●	4	*	4	.0331	M 14 x 1.5	
*	4	*	4	*	4	●	4	*	4	*	4	●	4	*	4	.0359	M 16 x 1.5	
														*	4	.0390	M 18 x 1.5	
																.0422	M 20 x 1.5	
																.0438	M 22 x 1.5	
																.0439	M 22 x 2	
																.0452	M 24 x 1.5	
																.0453	M 24 x 2	
																.0470	M 27 x 1.5	
																.0471	M 27 x 2	
																.0490	M 30 x 1.5	
																.0491	M 30 x 2	

Product Finder

v<sub>c</sub>

UNC

UNF

UNEF

UN-8

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

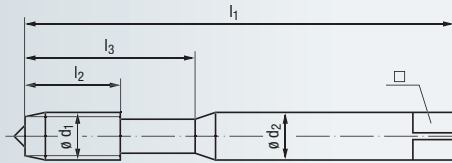
Accessories

Tech. Info

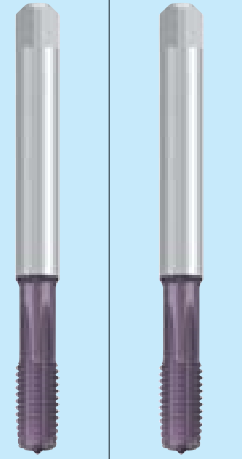


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF**
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



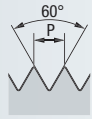
Reinforced Shank



**HCUT**  
Hardened steels

**HCUT**  
Hardened steels

# MF



ISO Metric fine thread  
DIN 13

Class of Fit  
Coating  
Technical Characteristics



Thread Depth and Hole Shape

Range of Application

6HX	6HX
TICN	TICN
<b>Carbide</b>	<b>Carbide</b>
<b>D / 4-5</b>	<b>C / 2-3</b>
O / P	O / P
max. 1.5 x d <sub>1</sub>	max. 1.5 x d <sub>1</sub>
H 1.3-4	H 1.3-4

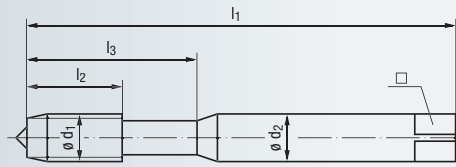
### Reinforced Shank

Reinforced Shank								Tool Identification		B016K101		B010K101					
Nominal Size $\varnothing d_1$	P	l <sub>1</sub>	mm						Dimens. ID	VHM Rekord 1A-HCUT/D TICN	Flutes	VHM Rekord 1A-HCUT/C TICN <sup>3)</sup>	Flutes				
M 8 x	1	90	15	35	8	6.2	7.1	.0251	★	5	★	5					
M 10 x	1	100	18	38	10	8	9.1	.0276	★	5	★	5					
M 12 x	1.5	110	21	41	12	9	10.6	.0303	★	5	★	5					
M 14 x	1.5	110	24	44	14	11	12.6	.0331	★	6	★	6					
M 16 x	1.5	110	24	44	16	12	14.6	.0359	★	6	★	6					

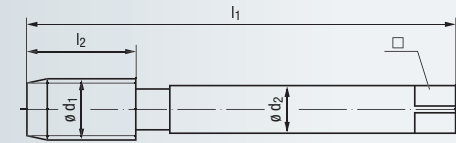
<sup>3)</sup> Please note: Use solid carbide tap VHM-Rekord 1A-HCUT/D-TICN as No.1 tap!



**DIN Length • DIN Shank**

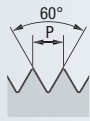


Reinforced Shank  
(M3x0.35 - M10x1.25)



Reduced Shank  
(M8x1 - M30x2)

**MF**



ISO Metric fine thread  
DIN 13

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

Range of Application



<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	<b>VA</b> Stainless steel materials
ISO 2/6H	<b>ISO 3/6G</b>	ISO 2/6H	ISO 2/6H	ISO 2/6H
		<b>LH</b>	TIN	NT
B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / 4-5
E / O	E / O	E / O	E / O	E / O / P

max. 3 x d<sub>1</sub>



P 1.1-2.1 N 2.2	P 1.1-2.1 N 2.2	P 1.1-2.1 N 2.2	P 1.1-4.1 M 1.1-3.1 K 2.1-2.2 N 1.4-5 N 2.2, 2.4-5	P 1.1-3.1 M 1.1-2.1 K 2.1 N 1.5, 2.4-5
--------------------	--------------------	--------------------	--	---

**Reinforced Shank**

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification		B0201000		B0201400		B0203000		
			l <sub>2</sub>	l <sub>3</sub>	l <sub>1</sub>			Rekord 1B-STEEL	Flutes	Rekord 1B-STEEL TIN	Flutes	Rekord 1B-VA	Flutes			
M 3 x 0.35		56	8	18	3.5	2.7	2.65	.0202	★	3						
M 4 x 0.5		63	10	21	4.5	3.4	3.5	.0210	★	3			★	3	★	3
M 5 x 0.5		70	11	25	6	4.9	4.5	.0218	★	3			★	3	★	3
M 6 x 0.75		80	13	30	6	4.9	5.2	.0229	★	3			★	3	★	3
M 8 x 0.75		80	14	30	8	6.2	7.2	.0250	★	3						
M 8 x 1		90	17	35	8	6.2	7	.0251	★	3			★	3	★	3
M 10 x 1		90	18	35	10	8	9	.0276	★	4			★	4	★	4
M 10 x 1.25		100	18	39	10	8	8.8	.0277	★	3						

**Reduced Shank**

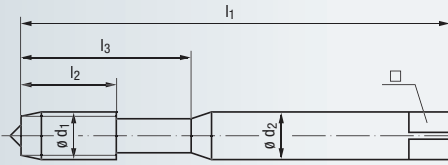
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification		C0201000		C0201020		C0201050		C0201400		C0203000	
			l <sub>2</sub>	l <sub>3</sub>	l <sub>1</sub>			Rekord 2B-STEEL	Flutes	Rekord 2B-STEEL	Flutes	Rekord 2B-STEEL-LH	Flutes	Rekord 2B-STEEL TIN	Flutes	Rekord 2B-VA	Flutes		
M 8 x 1		90	17	—	6	4.9	7	.0251	★	3	★	3	★	3			●	3	
M 10 x 1		90	18	—	7	5.5	9	.0276	★	4	★	4	★	4			●	4	
M 10 x 1.25		100	22	—	7	5.5	8.8	.0277	★	3									
M 12 x 1.5		100	22	—	9	7	10.5	.0303	★	3	★	3	★	3	★	3	●	3	
M 14 x 1.5		100	22	—	11	9	12.5	.0331	★	3	★	3	★	3	★	3	●	3	
M 16 x 1.5		100	22	—	12	9	14.5	.0359	★	3	★	3	★	3	★	3	●	3	
M 18 x 1.5		110	25	—	14	11	16.5	.0390	★	4	★	4	★	4	★	4	●	4	
M 20 x 1.5		125	25	—	16	12	18.5	.0422	★	4	★	4	★	4	★	4	●	4	
M 22 x 1.5		125	25	—	18	14.5	20.5	.0438	★	4	★	4	★	4	★	4	★	4	
M 22 x 2		140	27	—	18	14.5	20	.0439	★	3									
M 24 x 1.5		140	27	—	18	14.5	22.5	.0452	★	4	★	4	★	4			★	4	
M 24 x 2		140	27	—	18	14.5	22	.0453	★	4									
M 27 x 1.5		140	28	—	20	16	25.5	.0470	★	5									
M 27 x 2		140	28	—	20	16	25	.0471	★	4									
M 30 x 1.5		150	28	—	22	18	28.5	.0490	★	5	★	5					★	5	
M 30 x 2		150	28	—	22	18	28	.0491	★	4									

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

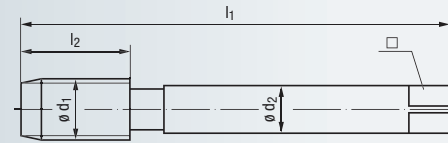


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF**
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank



Reinforced Shank  
(M3x0.35 - M10x1.25)



Reduced Shank  
(M8x1 - M30x2)



VA Stainless steel materials	Z CNC-controlled machines	Z CNC-controlled machines	Z CNC-controlled machines	MULTI Almost all materials
ISO 3/6G	6HX	6HX	6HX	ISO 2/6H
NT	TIN	TIN	GLT-1	NT2
B / 4-5	B / 4-5	B / 4-5	B / 4-5	B / 4-5
E / O / P	E / O / P	E / O	E / O / P	E / O / P



**ISO Metric fine thread  
DIN 13**

Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application

P 1.1-3.1	P 1.1-5.1	P 1.1-5.1	P 1.1-5.1	P 1.1-3.1
M 1.1-2.1	M 1.1-3.1	M 1.1-3.1	M 1.1-3.1	M 1.1-2.1
K 2.1	K 2.1	K 2.1	K 2.1	K 1.1-4.2
N 1.5, 2.4-5	N 1.4-2.2	N 1.4-2.2	N 1.4-2.2	N 1.4-5, 2.4-5
	S 1.1	S 1.1	S 1.1	



### Reinforced Shank

Nominal Size		P	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm	mm	mm	mm	mm	mm	Tool Identification		B0203020		B0203701		B020C401		B5207300	
Ø d <sub>1</sub>	Ø d <sub>2</sub>											Rekord 1B-VA	Flutes	Rekord 1B-Z TIN	Flutes	Rekord 1B-Z GLT-1	Flutes	Rekord 1B-MULTI NT2	Flutes	Rekord 1B-MULTI NT2	Flutes
M 3 x 0.35	56	8	18	3.5	2.7	2.65	.0202	*	3	*	3							*	3	*	3
M 4 x 0.5	63	10	21	4.5	3.4	3.5	.0210	*	3	*	3							*	3	*	3
M 5 x 0.5	70	11	25	6	4.9	4.5	.0218	*	3	*	3							*	3	*	3
M 6 x 0.75	80	13	30	6	4.9	5.2	.0229	*	3	*	3							*	3	*	3
M 8 x 0.75	80	14	30	8	6.2	7.2	.0250														
M 8 x 1	90	17	35	8	6.2	7	.0251													*	3
M 10 x 1	90	18	35	10	8	9	.0276													*	4
M 10 x 1.25	100	18	39	10	8	8.8	.0277														

### Reduced Shank

Nominal Size		P	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm	mm	mm	mm	mm	mm	Tool Identification		C0203020		C0203701		C1083701		C020C401		C5207300	
Ø d <sub>1</sub>	Ø d <sub>2</sub>											Rekord 2B-VA	Flutes	Rekord 2B-Z TIN	Flutes	Rekord 2B-Z-1KZN TIN	Flutes	Rekord 2B-Z GLT-1	Flutes	Rekord 2B-MULTI NT2	Flutes		
M 8 x 1	90	17	—	6	4.9	7	.0251	*	3	*	4	*	4	*	4	*	4	*	4	*	4	*	3
M 10 x 1	90	18	—	7	5.5	9	.0276	*	4	*	4	*	4	*	4	*	4	*	4	*	4	*	4
M 10 x 1.25	100	22	—	7	5.5	8.8	.0277	*	3	*	4	*	4	*	4	*	4	*	4	*	4	*	4
M 12 x 1.5	100	22	—	9	7	10.5	.0303	*	3	*	4	*	4	*	4	*	4	*	4	*	4	*	3
M 14 x 1.5	100	22	—	11	9	12.5	.0331	*	3	*	4	*	4	*	4	*	4	*	4	*	4	*	3
M 16 x 1.5	100	22	—	12	9	14.5	.0359	*	3	*	4	*	4	*	4	*	4	*	4	*	4	*	3
M 18 x 1.5	110	25	—	14	11	16.5	.0390	*	4	*	4	*	4	*	4	*	4	*	4	*	4	*	4
M 20 x 1.5	125	25	—	16	12	18.5	.0422	*	4	*	4	*	4	*	4	*	4	*	4	*	4	*	4
M 22 x 1.5	125	25	—	18	14.5	20.5	.0438														*	4	4
M 22 x 2	140	27	—	18	14.5	20	.0439																
M 24 x 1.5	140	27	—	18	14.5	22.5	.0452														*	4	4
M 24 x 2	140	27	—	18	14.5	22	.0453																
M 27 x 1.5	140	28	—	20	16	25.5	.0470																
M 27 x 2	140	28	—	20	16	25	.0471																
M 30 x 1.5	150	28	—	22	18	28.5	.0490														*	5	5
M 30 x 2	150	28	—	22	18	28	.0491																

$l_2 \approx 10 \times P$	$l_2 \approx 10 \times P$	$l_2 \approx 10 \times P$						
<b>SPEED</b> High-speed cutting	<b>SPEED</b> High-speed cutting	<b>Z-OKO</b> Dry machining and MQL	<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	<b>VA</b> Stainless steel materials	<b>VA</b> Stainless steel materials	
6HX	6HX	6HX	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	Class of Fit
TIN	TIN	TIN		TIN	TIN			Coating
B / 4-5	B / 4-5	B / 4-5	R15	R15	R15	R15	R15	Technical Characteristics
E / 0	E / 0	E / M / A	C / 2-3	C / 2-3	C / 2-3	<b>E / 1.5-2</b>	C / 2-3	
			E / 0	E / 0	E / 0	E / 0 / P	E / 0	

max. 3 x d<sub>1</sub>



max. 2 x d<sub>1</sub>



Thread Depth and Hole Shape

<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-2.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	Range of Application
<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>N 2.2</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	
<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1</b>		<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>	<b>K 2.1</b>	<b>K 2.1</b>	
<b>N 1.1-2.2</b>	<b>N 1.1-2.2</b>	<b>N 1.4-5</b>		<b>N 1.4-5, 2.4-5</b>	<b>N 1.4-5, 2.4-5</b>	<b>N 2.4-5</b>	<b>N 2.4-5</b>	
		<b>N 2.1-2, 2.4-5</b>						

			B0451000						B0963000			Tool Identification		
			Rekord 1D-STEEL	Flutes					Rekord 1D-VA-IKZ	Flutes	Flutes	Dimens. ID	Nominal Size $\varnothing d_1$	P
									upon			.0202	M 3 x 0.35	
												.0210	M 4 x 0.5	
			*	3					request			.0218	M 5 x 0.5	
			*	3								.0229	M 6 x 0.75	
			*	3								.0250	M 8 x 0.75	
			*	3								.0251	M 8 x 1	
			*	3								.0276	M 10 x 1	
			*	3								.0277	M 10 x 1.25	

C3203701		C3253701		C4203701		C0451000		C0401400		C0091400		C0463000		C0963000		Tool Identification			
Rekord 2B-SPEED TIN	Flutes	Rekord 2B-SPEED IKZN-TIN	Flutes	Rekord 2B-Z-OKO TIN	Flutes	Rekord 2D-STEEL	Flutes	Rekord 2DF-STEEL TIN	Flutes	Rekord 2DF-STEEL IKZ-TIN	Flutes	Rekord 2D-VA/E	Flutes	Rekord 2D-VA-IKZ	Flutes	Flutes	Dimens. ID	Nominal Size $\varnothing d_1$	P
*	4	*	4	*	4	*	3					*	3				.0251	M 8 x 1	
*	4	*	4	*	4	*	3					*	3				.0276	M 10 x 1	
*	4	*	4	*	4	*	3					*	3				.0277	M 10 x 1.25	
*	4	*	4	*	4	*	3	*	3	*	3	*	3	*	3		.0303	M 12 x 1.5	
*	4			*	4	*	3	*	3	*	3	*	3	*	3		.0331	M 14 x 1.5	
*	4			*	4	*	3	*	3	*	3	*	3	*	3		.0359	M 16 x 1.5	
*	4			*	4	*	4	*	4	*	4	*	4	*	4		.0390	M 18 x 1.5	
*	4			*	4	*	4	*	4	*	4	*	4	*	4		.0422	M 20 x 1.5	
						*	4	*	4	*	4	*	4	*	4		.0438	M 22 x 1.5	
						*	4					*	4				.0439	M 22 x 2	
						*	4					*	4				.0452	M 24 x 1.5	
						*	4										.0453	M 24 x 2	
						*	4										.0470	M 27 x 1.5	
						*	4										.0471	M 27 x 2	
						*	5					*	5				.0490	M 30 x 1.5	
						*	4										.0491	M 30 x 2	

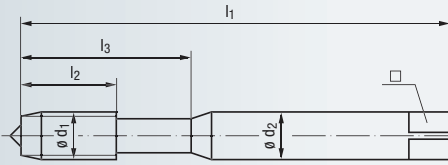
\* = Allow 7 days for delivery

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

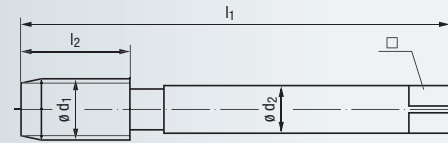


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF**
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank

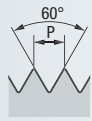


Reinforced Shank  
(M3x0.35 - M10x1.25)



Reduced Shank  
(M8x1 - M30x2)

# MF



ISO Metric fine thread  
DIN 13

Class of Fit  
Coating  
Technical Characteristics

Thread Depth  
and Hole Shape

Range of Application

<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>Z</b> CNC-controlled machines	<b>SPEED</b> High-speed cutting
6HX	6HX	6HX	6HX	6HX
TIN	TIN	TIN	TIN	TIN
R15	R15	<b>BF</b> R15	<b>BF</b> R15	R15
C/2-3	C/2-3	C/2-3	C/2-3	C/2-3
E/O/P	E/O	E/O/P	E/O	E/O

max. 2 x d<sub>1</sub>







<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-5.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>
<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>	<b>K 2.1-2</b>
<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-2.1</b>

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification	
			l <sub>2</sub>	l <sub>3</sub>	□			Dimens. ID	
M 3 x 0.35	56	4.5	18	3.5	2.7	2.65	.0202		
M 4 x 0.5	63	5	21	4.5	3.4	3.5	.0210		
M 5 x 0.5	70	5	25	6	4.9	4.5	.0218		
M 6 x 0.75	80	8	30	6	4.9	5.2	.0229		
M 8 x 0.75	80	8	30	8	6.2	7.2	.0250		
M 8 x 1	90	10	35	8	6.2	7	.0251		
M 10 x 1	90	10	35	10	8	9	.0276		
M 10 x 1.25	100	16	39	10	8	8.8	.0277		

### Reduced Shank

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification		C0453701		C0963701		C4223701		C4253701		C3223701	
			l <sub>2</sub>	l <sub>3</sub>	□			Dimens. ID	Rekord 2D-Z TIN	Flutes	Rekord 2D-Z-IKZ TIN	Flutes	Rekord 2D-Z-BF TIN	Flutes	Rekord 2D-Z-BF IKZ-TIN	Flutes	Rekord 2D-SPEED TIN	Flutes	
M 8 x 1	90	10	—	6	4.9	7	.0251	*	3	*	3	*	3	*	3	*	3	*	3
M 10 x 1	90	10	—	7	5.5	9	.0276	*	3	*	3	*	3	*	3	*	3	*	3
M 10 x 1.25	100	16	—	7	5.5	8.8	.0277	*	3	*	3	*	3	*	3	*	3	*	3
M 12 x 1.5	100	15	—	9	7	10.5	.0303	*	3	*	3	*	3	*	3	*	3	*	3
M 14 x 1.5	100	15	—	11	9	12.5	.0331												
M 16 x 1.5	100	15	—	12	9	14.5	.0359												
M 18 x 1.5	110	17	—	14	11	16.5	.0390												
M 20 x 1.5	125	17	—	16	12	18.5	.0422												
M 22 x 1.5	125	17	—	18	14.5	20.5	.0438												
M 22 x 2	140	20	—	18	14.5	20	.0439												
M 24 x 1.5	140	20	—	18	14.5	22.5	.0452												
M 24 x 2	140	20	—	18	14.5	22	.0453												
M 27 x 1.5	140	20	—	20	16	25.5	.0470												
M 27 x 2	140	20	—	20	16	25	.0471												
M 30 x 1.5	150	22	—	22	18	28.5	.0490												
M 30 x 2	150	22	—	22	18	28	.0491												

SPEED High-speed cutting		VA Stainless steel materials		STEEL Steel materials		STEEL Steel materials		STEEL Steel materials		VA Stainless steel materials		VA Stainless steel materials		Z CNC-controlled machines		Class of Fit Coating Technical Characteristics  Thread Depth and Hole Shape Range of Application	
6HX	6HX	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H		
TIN	Carbide R15	R35	LH, L35	TIN	R35	R35	R35	R35	R35	R35	R35	R35	R45	R45			
R15	E / 1.5-2	C / 2-3	E / O	C / 2-3	E / O	C / 2-3	E / O	C / 2-3	E / O / P	C / 2-3	E / O / P	C / 2-3	E / O / P	E / O / P			
max. 2 x d <sub>1</sub> 		max. 2.5 x d <sub>1</sub> 								max. 3 x d <sub>1</sub> 							
P 1.1-4.1	P 5.1	P 1.1-2.1	P 1.1-2.1	P 1.1-4.1	P 1.1-3.1	P 1.1-3.1	P 1.1-4.1	M 1.1-3.1	K 2.1-2	N 1.4-2.1	K 1.1-4.2	N 1.5-6, 2.6-8	N 5.1-2				
M 1.1-3.1	K 2.1-2	N 2.2	N 2.2	M 1.1-3.1	K 2.1-2.2	N 2.2, 2.4-5	M 1.1-3.1	K 2.1	N 2.1								
B0980101		B0501000						B0503000		B0503200		B0513500		Tool Identification			
	VHM Rekord 1D-VA/E-IKZ	Enorm 1-STEEL	Enorm 1-VA	Enorm 1-VA NE2	Enorm 1-Z/E	Dimens. ID	Nominal Size ø d <sub>1</sub>	P									
	Flutes	Flutes	Flutes	Flutes	Flutes												
		★	★	★	★	.0202	M 3 x 0.35										
		★	★	★	★	.0210	M 4 x 0.5										
		★	★	★	★	.0218	M 5 x 0.5										
		★	★	★	★	.0229	M 6 x 0.75										
		★	★	★	★	.0250	M 8 x 0.75										
	★	★	★	★	★	.0251	M 8 x 1										
	★	★	★	★	★	.0276	M 10 x 1										
	★	★	★	★	★	.0277	M 10 x 1.25										
C3233701		C0980101		C0501000		C0501050		C0501400		C0503000		C0503200		C0513500		Tool Identification	
Rekord 2D-SPEED IKZ-TIN	VHM Rekord 2D-VA/E-IKZ	Enorm 2-STEEL	Enorm 2-STEEL-LH	Enorm 2-STEEL TIN	Enorm 2-VA	Enorm 2-VA NE2	Enorm 2-Z/E	Dimens. ID	Nominal Size ø d <sub>1</sub>	P							
Flutes	Flutes	Flutes	Flutes	Flutes	Flutes	Flutes	Flutes										
★	★	★	★	★	★	★	★	.0251	M 8 x 1								
★	★	★	★	★	★	★	★	.0276	M 10 x 1								
★	★	★	★	★	★	★	★	.0277	M 10 x 1.25								
★	★	★	★	★	★	★	★	.0303	M 12 x 1.5								
		★	★	★	★	★	★	.0331	M 14 x 1.5								
		★	★	★	★	★	★	.0359	M 16 x 1.5								
		★	★	★	★	★	★	.0390	M 18 x 1.5								
		★	★	★	★	★	★	.0422	M 20 x 1.5								
		★	★	★	★	★	★	.0438	M 22 x 1.5								
		★	★	★	★	★	★	.0439	M 22 x 2								
		★	★	★	★	★	★	.0452	M 24 x 1.5								
		★	★	★	★	★	★	.0453	M 24 x 2								
		★	★	★	★	★	★	.0470	M 27 x 1.5								
		★	★	★	★	★	★	.0471	M 27 x 2								
		★	★	★	★	★	★	.0490	M 30 x 1.5								
		★	★	★	★	★	★	.0491	M 30 x 2								

Product Finder

v<sub>c</sub>

UNC

UNF

UNEF

UN-8

MF

NPSM/NPSC

NPSF

R<sub>p</sub> (BSPP)

G

PT

NPTF

R<sub>c</sub> (BSPT)

STI

SELF-LOCK

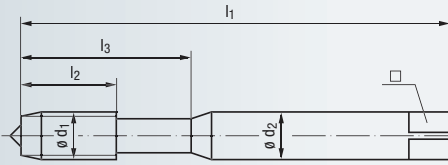
Accessories

Tech. Info

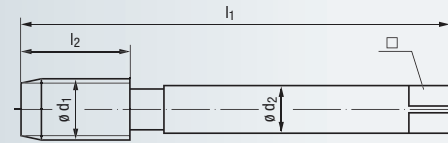


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF**
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank

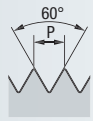


Reinforced Shank  
(M3x0.35 - M10x1.25)



Reduced Shank  
(M8x1 - M30x2)

# MF



ISO Metric fine thread  
DIN 13

Class of Fit **ISO 3/6G**  
Coating R45  
Technical Characteristics **E / 1.5-2**

Thread Depth and Hole Shape

Range of Application

Z	Z	Z	Z	Z
CNC-controlled machines	CNC-controlled machines	CNC-controlled machines	CNC-controlled machines	CNC-controlled machines
<b>ISO 3/6G</b>	ISO 2/6H	ISO 2/6H	ISO 2/6H	ISO 2/6H
R45	R45	TIN	TIN	GLT-1
<b>E / 1.5-2</b>	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>
E / O / P	E / O	E / O / P	E / O	E

max. 3 x d<sub>1</sub>



<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>
<b>N 2.1</b>	<b>N 2.1</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>	<b>N 1.4-6</b>
		<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>
		<b>S 1.1</b>	<b>S 1.1</b>	<b>S 1.1</b>

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification		B0513520		B0973500					
			l <sub>2</sub>	l <sub>3</sub>	□			Dimens. ID	Enorm 1-Z/E	Flutes	Enorm 1-Z/E-IKZ	Flutes					
M 3 x 0.35	56	4.5	18	3.5	2.7	2.65	.0202										
M 4 x 0.5	63	5	21	3.5	3.4	2.65	.0210	*	3	upon							
M 5 x 0.5	70	5	25	4.5	4.5	2.65	.0218	*	3								
M 6 x 0.75	80	8	30	4.5	5.2	2.65	.0229	*	3	request							
M 8 x 0.75	80	8	30	6.2	7.2	2.65	.0250										
M 8 x 1	90	10	35	7	7	2.65	.0251										
M 10 x 1	90	10	35	8	9	2.65	.0276										
M 10 x 1.25	100	16	39	8.8	8.8	2.65	.0277										

### Reduced Shank

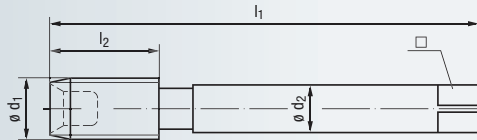
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification		C0513520		C0973500		C0513700		C0973700		C051C400	
			l <sub>2</sub>	l <sub>3</sub>	□			Dimens. ID	Enorm 2-Z/E	Flutes	Enorm 2-Z/E-IKZ	Flutes	Enorm 2-Z/E TIN	Flutes	Enorm 2-Z/E-IKZ TIN	Flutes	Enorm 2-Z/E GLT-1	Flutes	
M 8 x 1	90	10	—	6	4.9	7	.0251	*	3				*	3			*	3	
M 10 x 1	90	10	—	7	5.5	9	.0276	*	4				*	4			*	4	
M 10 x 1.25	100	16	—	7	5.5	8.8	.0277												
M 12 x 1.5	100	15	—	9	7	10.5	.0303	*	5	*	5	*	5	*	5	*	5	5	
M 14 x 1.5	100	15	—	11	9	12.5	.0331	*	5	*	5	*	5	*	5	*	5	5	
M 16 x 1.5	100	15	—	12	9	14.5	.0359	*	5	*	5	*	5	*	5	*	5	5	
M 18 x 1.5	110	17	—	14	11	16.5	.0390	*	5	*	5	*	5	*	5	*	5	5	
M 20 x 1.5	125	17	—	16	12	18.5	.0422	*	5	*	5	*	5	*	5	*	5	5	
M 22 x 1.5	125	17	—	18	14.5	20.5	.0438												
M 22 x 2	140	20	—	18	14.5	20	.0439												
M 24 x 1.5	140	20	—	18	14.5	22.5	.0452	*	5										
M 24 x 2	140	20	—	18	14.5	22	.0453												
M 27 x 1.5	140	20	—	20	16	25.5	.0470												
M 27 x 2	140	20	—	20	16	25	.0471												
M 30 x 1.5	150	22	—	22	18	28.5	.0490												
M 30 x 2	150	22	—	22	18	28	.0491												



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF**
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank

With internal chip collector



Reduced Shank

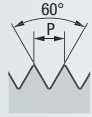


**VA**  
Stainless steel materials



**VA**  
Stainless steel materials

# MF

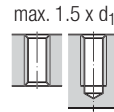


ISO Metric fine thread  
DIN 13

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape



Range of Application

- P 1.1-4.1**
- M 1.1-2.1**
- K 1.1-4.2**

### Reduced Shank

#### Tool Identification

**C0803001**

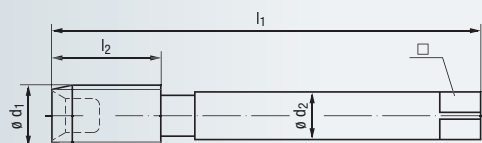
**C0803101**

Nominal Size $\varnothing d_1$	P	$l_1$	mm $l_2$	$\varnothing d_2$	$\square$		Dimens. ID	C0803001		C0803101	
								Robust 2X-VA	Flutes	Robust 2X-VA TIN	Flutes
M 20 x 1.5	1.5	125	25	16	12	18.5	.0422	★	5		
M 22 x 1.5	1.5	125	25	18	14.5	20.5	.0438	★	5	upon	
M 24 x 1.5	1.5	140	27	18	14.5	22.5	.0452	★	5		
M 24 x 2	2	140	27	18	14.5	22	.0453	★	5	request	
M 27 x 1.5	1.5	140	28	20	16	25.5	.0470	★	5		
M 27 x 2	2	140	28	20	16	25	.0471	★	5		
M 30 x 1.5	1.5	150	28	22	18	28.5	.0490	★	6		
M 33 x 1.5	1.5	160	30	25	20	31.5	.0511	★	6		
M 33 x 2	2	160	30	25	20	31	.0512	★	6		
M 36 x 1.5	1.5	170	30	28	22	34.5	.0532	★	6		
M 36 x 2	2	170	30	28	22	34	.0533	★	6		
M 36 x 3	3	200	42	28	22	33	.0534	★	6		
M 38 x 1.5	1.5	170	30	28	22	36.5	.0546	★	6		
M 39 x 3	3	200	42	32	24	36	.0555	★	6		
M 40 x 2	2	170	30	32	24	38	.0561	★	6		
M 42 x 1.5	1.5	170	30	32	24	40.5	.0574	★	6		
M 42 x 2	2	170	30	32	24	40	.0575	★	6		
M 42 x 3	3	200	45	32	24	39	.0576	★	6		
M 45 x 3	3	200	45	36	29	42	.0597	★	6		
M 48 x 1.5	1.5	190	32	36	29	46.5	.0616	★	8		
M 48 x 2	2	190	32	36	29	46	.0617	★	7		
M 48 x 3	3	225	50	36	29	45	.0618	★	6		
M 52 x 3	3	225	50	40	32	49	.0646	★	6		
M 56 x 3	3	225	50	40	32	53	.0661	★	7		
M 56 x 4	4	250	60	40	32	52	.0662	★	7		
M 60 x 4	4	280	60	45	35	56	.0672	★	7		
M 64 x 3	3	275	55	50	39	61	.0681	★	8		
M 64 x 4	4	315	65	50	39	60	.0682	★	7		
M 68 x 4	4	315	65	50	39	64	.0692	★	7		
M 70 x 3	3	275	55	50	39	67	.0696	★	8		



**DIN Length • DIN Shank**

With internal chip collector



Reduced Shank

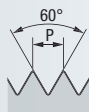


**VA**  
Stainless steel materials



**VA**  
Stainless steel materials

**MF**  
ISO Metric fine thread  
DIN 13

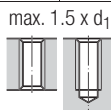


Class of Fit  
Coating  
Technical Characteristics



6HX	6HX
NE2	TIN
C / 2-3	C / 2-3
P / O 1)	P / O 1)

Thread Depth and Hole Shape



Range of Application

P 1.1-4.1	P 1.1-4.1
M 1.1-2.1	M 1.1-2.1
K 1.1-4.2	K 1.1-4.2

**Reduced Shank**

**Tool Identification**

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm l <sub>2</sub>	ø d <sub>2</sub>	□	Image	Dimens. ID	C0803001		C0803101	
								Robust 2X-VA	Flutes	Robust 2X-VA TIN	Flutes
M 70 x 4	4	340	65	50	39	66	.0697	*	7		
M 72 x 3	3	275	55	50	39	69	.0702	*	8	upon	
M 72 x 4	4	340	65	50	39	68	.0703	*	8		
M 72 x 6	6	340	80	50	39	66	.0704	*	7	request	
M 76 x 3	3	275	55	50	39	73	.0714	*	8		
M 76 x 4	4	340	65	50	39	72	.0715	*	8		
M 76 x 6	6	340	80	50	39	70	.0716	*	7		
M 80 x 4	4	360	65	50	39	76	.0727	*	10		
M 80 x 6	6	360	80	50	39	74	.0728	*	8		
M 85 x 3	3	325	60	50	39	82	.0736	*	10		
M 85 x 4	4	380	70	50	39	81	.0737	*	10		
M 90 x 3	3	325	60	50	39	87	.0746	*	10		
M 90 x 4	4	380	70	50	39	86	.0747	*	10		
M 90 x 6	6	380	80	50	39	84	.0748	*	9		
M 95 x 6	6	400	85	56	44	89	.0758	*	9		
M 100 x 4	4	400	70	56	44	96	.0767	*	10		
M 100 x 6	6	400	85	56	44	94	.0768	*	10		
M 110 x 6	6	400	85	56	44	104	.0788	*	10		
M 115 x 3	3	350	65	56	44	112	.0791	*	12		
M 120 x 4	4	400	75	56	44	116	.0797	*	12		
M 120 x 6	6	400	90	56	44	114	.0798	*	10		

Shank with grooves for better handling!

1) If possible, use paste lubrication, coating both the tool and the walls of the drilled hole.  
Lubrication with oil is possible only in the vertical machining of blind holes, if the hole is entirely filled with oil.

Larger sizes priced upon request.

**The Complete Tool System**

Robust 2X-VA Taps when used with a KSN Type tapping attachment creates the optimal tapping unit!

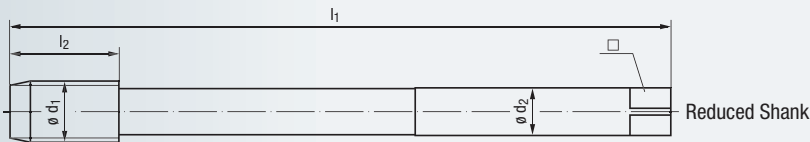
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF**
- NPSM/NPSC
- NPSF
- R<sub>p</sub> (BSPP)
- G
- NPT
- NPTF
- R<sub>c</sub> (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



- Product Finder
- Vc
- UNC
- UNF
- UNEF
- UN-8
- M
- MF**
- NPSM/NPSC
- NPSF
- Rp (BSPP)
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- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### Extra Length • DIN Shank

With long flutes



**Z** CNC-controlled machines  
**Z** CNC-controlled machines  
**Z** CNC-controlled machines



**ISO Metric fine thread  
DIN 13**

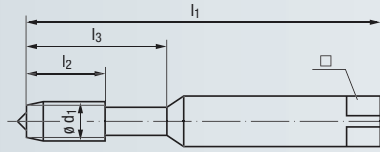
Class of Fit	GHX	GHX	GHX
Coating	GLT-1	GLT-1	GLT-1
Technical Characteristics	C / 2-3	R15	<b>BF</b> R15
	E / 0	C / 2-3	C / 2-3
	E / 0	E / 0	E / 0
Thread Depth and Hole Shape	max. 4 x d <sub>1</sub> 	max. 4 x d <sub>1</sub> 	max. 4 x d <sub>1</sub> 
Range of Application	<b>P 2.1-5.1</b> <b>K 1.1-4.2</b> <b>N 1.4-6, 2.4-7</b> <b>N 4.1</b>	<b>P 1.1-5.1</b> <b>M 1.1-3.1</b> <b>K 2.1</b> <b>N 1.4-6, 2.4-5</b>	<b>P 1.1-5.1</b> <b>M 1.1-3.1</b> <b>K 2.1</b> <b>N 1.4-6, 2.4-5</b>

### Reduced Shank

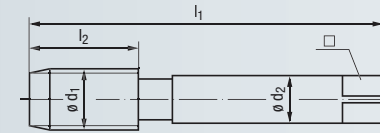
Reduced Shank							Tool Identification		C053C401		C428C401		C406C401	
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm l <sub>2</sub>	ø d <sub>2</sub>	□		Dimens. ID	Rekord 2A-Z IKZ-LF4 GLT-1	Flutes	Rekord 2D-Z IKZ-LF4 GLT-1	Flutes	Rekord 2D-Z-BF IKZ-LF4 GLT-1	Flutes	
M 24 x 2	2	240	20	18	14.5	22	.0453	upon		upon		★	4	
M 30 x 2	2	270	22	22	18	28	.0491	upon		upon		★	4	
M 36 x 3	3	310	30	28	22	33	.0534	request		request		★	4	

1) Threading in through holes is possible only with external cooling/lubrication

**ANSI Length • ANSI Shank**



Reinforced Shank  
(M10x1 - M10x1.25)



Reduced Shank  
(M12x1.5 - M14x1.5)

**MF**



ISO Metric fine thread  
DIN 13

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

Range of Application

**H** Materials of high tensile strength  
**H** Materials of high tensile strength  
**STEEL** Steel materials  
**VA** Stainless steel materials  
**STEEL** Steel materials

6HX	6HX	ISO 2/6H	ISO 2/6H	ISO 2/6H
NT	TIN	TIN	NT	TIN
<b>E / 1.5-2</b>	<b>E / 1.5-2</b>	B / 4-5	B / 4-5	C / 2-3
E / O / P	E / O / P	E / O	E / O / P	E / O



<b>P 2.1-4.1</b>	<b>P 2.1-5.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-4.1</b>
<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>	<b>M 1.1-3.1</b>	<b>M 1.1-2.1</b>	<b>M 1.1-3.1</b>
<b>N 2.4-7</b>	<b>N 2.4-7, 4.1</b>	<b>K 2.1-2.2</b>	<b>K 2.1</b>	<b>K 1.1-4.2</b>
<b>N 4.1, 5.1</b>		<b>N 1.4-5</b>	<b>N 1.5, 2.4-5</b>	<b>N 1.4-5, 2.4-5</b>

**Tool Identification**

Nominal Size ø d <sub>1</sub>	P mm	inch				ø d <sub>2</sub>	□	Tool Identification	AU110501		AU110601		AU201400		AU203000		AU461400	
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	□				Rekord A-H/E	Flutes	Rekord A-H/E TIN	Flutes	Rekord B-STEEL TIN	Flutes	Rekord B-VA	Flutes	Rekord D-STEEL/E TIN	Flutes
M 10 x 1	2 15/16	2.94	0.709	1.378	0.381	0.286	9	.0276	●	4	●	4	●	4	●	4	●	3
M 10 x 1.25	2 15/16	2.94	0.709	1.378	0.381	0.286	8.8	.0277	●	3	●	3	●	3	●	3	●	3
M 12 x 1.5	3 3/8	3.38	0.866	—	0.367	0.275	10.5	.0303	●	4	●	4	●	3	●	3	●	3
M 14 x 1.5	3 19/32	3.59	0.866	—	0.429	0.322	12.5	.0331	●	4	●	4	●	3	●	3	●	3

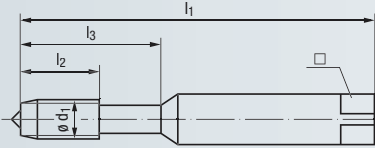
Drill or countersink diameters are in mm!

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF**
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

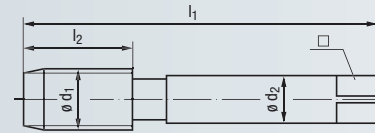


- Product Finder
- Vc
- UNC
- UNF
- UNEF
- UN-8
- M
- MF**
- NPSM/NPSC
- NPSF
- Rp (BSPP)
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- NPT
- NPTF
- Rc (BSPT)
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- SELF-LOCK
- Accessories
- Tech. Info

### ANSI Length - ANSI Shank



Reinforced Shank  
(M10x1 - M10x1.25)



Reduced Shank  
(M12x1.5 - M14x1.5)



**VA**  
Stainless steel materials

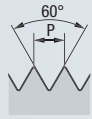


**STEEL**  
Steel materials



**VA**  
Stainless steel materials

# MF



ISO Metric fine thread  
DIN 13

Class of Fit: ISO 2/6H  
Coating: R15  
Technical Characteristics: E / 1.5-2, E / O / P

Class of Fit: ISO 2/6H  
Coating: TIN  
Technical Characteristics: R35, C / 2-3, E / O

Class of Fit: ISO 2/6H  
Coating: R35  
Technical Characteristics: C / 2-3, E / O / P

Thread Depth and Hole Shape: max. 2 x d<sub>1</sub>



Thread Depth and Hole Shape: max. 2.5 x d<sub>1</sub>



Range of Application

- P 1.1-3.1
- M 1.1-2.1
- K 2.1
- N 2.4-5

- P 1.1-4.1
- M 1.1-3.1
- K 2.1-2.2
- N 2.2, 2.4-5

- P 1.1-3.1
- M 1.1-2.1
- K 2.1

#### Tool Identification

AU463000

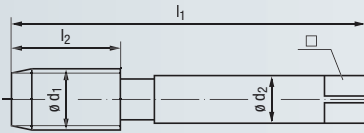
AU501400

AU503000

Nominal Size ø d <sub>1</sub>	P mm	inch						Flutes	Rekord D-VA/E	Flutes	Enorm STEEL TIN	Flutes	Enorm VA	Flutes	
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	□	Dimens. ID								
M 10 x 1	2	15/16	2.94	0.709	1.378	0.381	0.286	9	.0276	●	3	●	3	●	3
M 10 x 1.25	2	15/16	2.94	0.709	1.378	0.381	0.286	8.8	.0277	●	3	●	3	●	3
M 12 x 1.5	3	3/8	3.38	0.866	—	0.367	0.275	10.5	.0303	●	3	●	4	●	4
M 14 x 1.5	3	19/32	3.59	0.866	—	0.429	0.322	12.5	.0331	●	3	●	4	●	4

Drill or countersink diameters are in mm!

**DIN Length • DIN Shank**



Reduced Shank



**STEEL** Steel materials | **STEEL** Steel materials | **STEEL** Steel materials | **STEEL** Steel materials | **VA** Stainless steel materials

**MF**



**ISO Metric fine thread  
DIN 13**

Class of Fit: 6HX  
Coating: 6HX  
Technical Characteristics: C/2-3, E/O



Thread Depth and Hole Shape

Range of Application

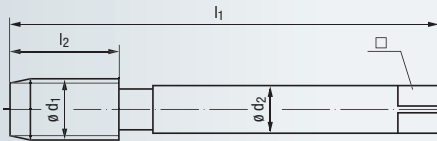
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification		A0101001		A0101051		A0201000		A0451000		A0463000	
			Rekord A-STEEL	Flutes	Rekord A-STEEL-LH			Flutes	Rekord B-STEEL	Flutes	Rekord D-STEEL	Flutes	Rekord D-VA/E	Flutes					
M 10	x 1	63	18	-	7	5.5	9	.0276	★	4	★	4	★	4	★	3	★	3	
M 10	x 1.25	70	22	-	7	5.5	8.8	.0277	★	3	★	3	★	3	★	3	★	3	
M 12	x 1.5	70	20	-	9	7	10.5	.0303	★	4	★	4	★	3	★	3	★	3	
M 14	x 1.5	70	20	-	11	9	12.5	.0331	★	4	★	4	★	3	★	3	★	3	

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF**
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC**
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



Reduced Shank



**STEEL**  
Steel materials

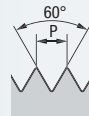


**Z**  
CNC-controlled machines



**Z**  
CNC-controlled machines

# NPSM/ NPSC



American Standard straight pipe thread  
ANSI B1.20.1  
for mechanical joints (previously NPS)

Class of Fit: "X"  
Coating: Technical Characteristics  
Thread Depth and Hole Shape

Coating	"X"	TIN
Technical Characteristics	C / 2-3 E / 0	R45 E / 1.5-2 E / 0 / P
Thread Depth and Hole Shape	max. 2 x d <sub>1</sub>	max. 3 x d <sub>1</sub>

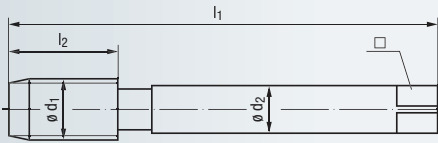
Range of Application

P 1.1-2.1 N 2.3	P 1.1-4.1 M 1.1-2.1 N 2.1	P 1.1-4.1 M 1.1-3.1 N 1.4-6 N 2.1-2, 2.4-5 S 1.1
--------------------	---------------------------------	--

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	mm						Tool Identification		C0101001		C0513500		C0513700	
		ø d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	ø d <sub>2</sub>	□	NPSM	NPSC	Dimens. ID	Rekord 2A-STEEL	Flutes	Enorm 2-Z/E	Flutes	Enorm 2-Z/E TIN	Flutes
1/8	27	10.100	90	18	7	5.5	9.1	8.75	.5858	●	4	●	4	●	4
1/4	18	13.404	100	22	11	9	12	11.1	.5859	●	4	●	5	●	5
3/8	18	16.843	100	22	12	9	15.5	14.7	.5860	★	4	●	5	●	5
1/2	14	20.949	125	25	16	12	19	18.25	.5861	★	4	●	5	●	5
3/4	14	26.296	140	28	20	16	24.5	23.4	.5862	★	4	●	5		
1	11 1/2	32.895	160	30	25	20	30.5	29.35	.5863	★	5	●	6		

**DIN Length · DIN Shank**



Reduced Shank



**STEEL**  
Steel materials

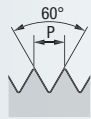


**Z**  
CNC-controlled machines



**Z**  
CNC-controlled machines

**NPSF**



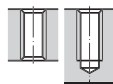
**American Standard straight pipe thread ANSI B1.20.3**

dryseal internal straight pipe thread for fuel, combined with external tapered pipe thread NPTF or PTF-SAE-SHORT; Gauge with tapered gauges

Class of Fit: "X"  
Coating: Technical Characteristics  
Thread Depth and Hole Shape: max. 2 x d<sub>1</sub>

Range of Application

Coating: C / 2-3  
E / O



P 1.1-2.1  
N 2.3

Coating: R45  
E / 1.5-2  
E / O / P

max. 3 x d<sub>1</sub>



P 1.1-4.1  
M 1.1-2.1  
N 2.1  
P 1.1-4.1  
M 1.1-3.1  
N 1.4-6  
N 2.1-2, 2.4-5  
S 1.1

**Reduced Shank**

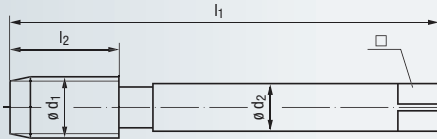
Nominal Size ø d <sub>1</sub>	T.P.I.	ø d <sub>1</sub>	l <sub>1</sub>	mm		ø d <sub>2</sub>	□	Tool Identification		C0101001		C0513500		C0513700	
				l <sub>2</sub>	l <sub>2</sub>			Rekord 2A-STEEL	Flutes	Enorm 2-Z/E	Flutes	Enorm 2-Z/E TIN	Flutes		
1/16	27	7.582	90	17	6	4.9	6.25	.5904	★	3	●	3	●	3	
1/8	27	9.929	90	18	7	5.5	8.6	.5905	●	4	●	4	●	4	
1/4	18	13.236	100	22	11	9	11.15	.5906	●	4	●	5	●	5	
3/8	18	16.673	100	22	12	9	14.7	.5907	●	4	●	5	●	5	
1/2	14	20.819	125	25	16	12	17.85	.5908	●	4	●	5	●	5	
3/4	14	26.166	140	28	20	16	23.4	.5909	●	4	●	5			
1	11 1/2	32.718	160	30	25	20	29.35	.5910	★	5	●	6			

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF**
- R<sub>p</sub> (BSPP)
- G
- P
- NPTF
- R<sub>c</sub> (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)**
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



Reduced Shank



**STEEL**  
Steel materials



**Z**  
CNC-controlled machines

### Rp (BSPP)



**Cylindrical Whitworth pipe thread  
DIN EN 10226-1 and ISO 7-1**  
where pressure-tight joints are made on the threads

Class of Fit: "X"  
Coating: R45  
Technical Characteristics: C / 2-3, E / 0, E / 0 / P

Thread Depth and Hole Shape: max. 2 x d<sub>1</sub>, max. 3 x d<sub>1</sub>

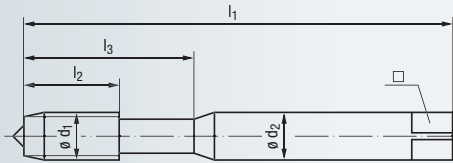
Range of Application: P 1.1-2.1, N 2.3, P 1.1-4.1, M 1.1-2.1, N 2.1

### Reduced Shank

Reduced Shank								Tool Identification		C0101001		C0513500					
Nominal Size ø d <sub>1</sub>	T.P.I.	ø d <sub>1</sub>	l <sub>1</sub>	mm		ø d <sub>2</sub>	□	Image	Dimens. ID	Rekord 2A-STEEL	Flutes	Enorm 2-Z/E	Flutes				
				l <sub>2</sub>	ø d <sub>2</sub>					★		●					
Rp 1/16	28	7.72	90	17	6	4.9		6.55	.4091								
Rp 1/8	28	9.73	90	18	7	5.5		8.6	.4092	★	4	●	4				
Rp 1/4	19	13.16	100	22	11	9		11.5	.4093	★	4	●	5				
Rp 3/8	19	16.66	100	22	12	9		15	.4094	★	4	●	5				
Rp 1/2	14	20.96	125	25	16	12		18.5	.4095	★	4	●	5				
Rp 3/4	14	26.44	140	28	20	16		24	.4096	★	4	●	5				
Rp 1	11	33.25	160	30	25	20		30.25	.4097	★	5	●	6				



**DIN Length · DIN Shank**



Reinforced Shank



**HCUT**  
Hardened steels



**HCUT**  
Hardened steels



**HCUT**  
Hardened steels

**G**

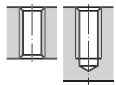

**Whitworth pipe thread  
DIN EN ISO 228**

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

Range of Application

Class of Fit	"X"	"X"	"X"
Coating	TICN	TICN	TICN
Technical Characteristics	<b>HSSE-PM</b>	<b>Carbide</b>	<b>Carbide</b>
	C / 2-3	<b>D / 4-5</b>	<b>C / 2-3</b>
	O / P	O / P	O / P
Thread Depth and Hole Shape	max. 1.5 x d <sub>1</sub> 		max. 1.5 x d <sub>1</sub> 
Range of Application	H 1.1-2	H 1.3-4	H 1.3-4

**Reinforced Shank**

Nominal Size ø d <sub>1</sub>	T.P.I.	mm							Tool Identification		B010J901	B016K101	B010K101				
		ø d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	□	Dimens. ID	Rekord 1A-HCUT TICN	Flutes				VHM Rekord 1A-HCUT/D TICN	Flutes	VHM Rekord 1A-HCUT/C TICN <sup>3)</sup>	Flutes
G 1/8	28	9.73	90	10	35	10	8	8.8	.4035	★	5						
G 1/8	28	9.73	100	18	38	10	8	8.8	.4035			★	5	★	5		
G 1/4	19	13.16	110	24	44	14	11	11.9	.4036			★	6	★	6		

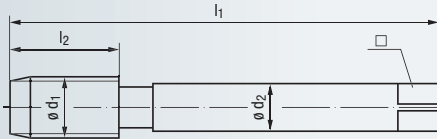
<sup>3)</sup> Please note: Use solid carbide tap VHM-Rekord 1A-HCUT/D-TICN as No.1 tap!

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G**
- PPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



Reduced Shank



**STEEL**  
Steel materials



**H**  
Materials of high tensile strength



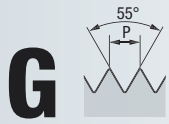
**H**  
Materials of high tensile strength



**HCUT**  
Hardened steels



**H**  
Materials of high tensile strength



**G**  
Whitworth pipe thread  
DIN EN ISO 228

Class of Fit: "X"  
Coating: NT, TiCN, HSSE-PM, Carbide  
Technical Characteristics: C/2-3, E/O, E/O/P, O/P

Thread Depth and Hole Shape: max. 2 x d<sub>1</sub>, max. 1.5 x d<sub>1</sub>, max. 2 x d<sub>1</sub>

Range of Application: P 1.1-2.1, N 2.3, P 2.1-4.1, K 1.1-4.2, N 2.4-7, N 4.1, 5.1, P 2.1-5.1, K 1.1-4.2, N 2.4-7, 4.1, H 1.1-2, P 5.1, K 1.1-4.2, N 1.5-6, 2.6-8, N 5.1-2, H 1.1-2

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	ø d <sub>1</sub>	l <sub>1</sub>	mm l <sub>2</sub>	ø d <sub>2</sub>	□	Tool Identification		C0101001		C0100501		C0109101		C010J901		C1960901	
							Rekord 2A-STEEL	Flutes	Rekord 2A-H	Flutes	Rekord 2A-H TiCN	Flutes	Rekord 2A-HCUT TiCN <sup>2)</sup>	Flutes	VHM/KHM Rekord 2A-H/E-1KZ	Flutes		
G 1/16	28	7.72	90	17	6	4.9	6.8	.4034	*	3								
G 1/8	28	9.73	90	18	7	5.5	8.8	.4035	*	4	*	4	*	4			*	4
G 1/4	19	13.16	100	22	11	9	11.8	.4036	*	4	*	4	*	4	*	6	*	4
G 3/8	19	16.66	100	22	12	9	15.25	.4037	*	4	*	4	*	4			*	4
G 1/2	14	20.96	125	25	16	12	19	.4038	*	4	*	4	*	4			*	4
G 5/8	14	22.91	125	25	18	14.5	21	.4039	*									
G 3/4	14	26.44	140	28	20	16	24.5	.4040	*	4	*	4						
G 7/8	14	30.20	150	28	22	18	28.25	.4041	*									
G 1	11	33.25	160	30	25	20	30.75	.4042	*	5	*	5						
G 1 1/8	11	37.90	170	30	28	22	35.5	.4043	*	5	*	5						
G 1 1/4	11	41.91	170	30	32	24	39.5	.4044	*	6	*	6						
G 1 3/8	11	44.32	180	32	36	29	41.75	.4045	*	6	*	6						
G 1 1/2	11	47.80	190	32	36	29	45.25	.4046	*	6	*	6						
G 1 5/8	11	52.00	190	32	40	32	49.5	.4047	*	6								
G 1 3/4	11	53.75	190	32	40	32	51	.4048	*		*	6						
G 2	11	59.61	220	40	45	35	57	.4050	*	8	*	8						

1) Threading in through holes is possible only with external cooling/lubrication

2) Increase drill diameter for taps Rekord 2A-HCUT-TiCN by 0.1 mm

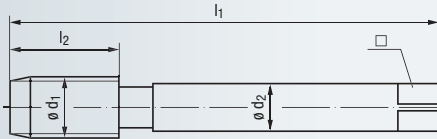
C0201000			C0201400			C0203000			C0451000			C0401400			C0463000			Tool Identification		
Rekord 2B-STEEL	Flutes		Rekord 2B-STEEL TIN	Flutes		Rekord 2B-VA	Flutes		Rekord 2D-STEEL	Flutes		Rekord 2DF-STEEL TIN	Flutes		Rekord 2D-VA/E	Flutes		Dimens. ID	Nominal Size $\varnothing d_1$	T.P.I.
★	3		★	3		★	3		★	3		★	3		★	3		.4034	G 1/16	28
★	3		★	3		★	3		★	3		★	3		★	3		.4035	G 1/8	28
★	3		★	3		★	3		★	3		★	3		★	3		.4036	G 1/4	19
★	4		★	4		★	4		★	4		★	4		★	4		.4037	G 3/8	19
																		.4038	G 1/2	14
★	4					★	4		★	4					★	4		.4039	G 5/8	14
																		.4040	G 3/4	14
																		.4041	G 7/8	14
★	4					★	4		★	4					★	4		.4042	G 1	11
★	5								★	5								.4043	G 1 1/8	11
★	6								★	6								.4044	G 1 1/4	11
★	6								★	6								.4045	G 1 3/8	11
★	6								★	6								.4046	G 1 1/2	11
★	6																	.4047	G 1 5/8	11
★	6																	.4048	G 1 3/4	11
★	8																	.4050	G 2	11

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
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- NPSF
- Rp (BSPP)
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- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
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- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G**
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



Reduced Shank



**STEEL**  
Steel materials



**STEEL**  
Steel materials



**VA**  
Stainless steel materials



**Z**  
CNC-controlled machines



**Z**  
CNC-controlled machines

**G**

**Whitworth pipe thread  
DIN EN ISO 228**

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

Range of Application

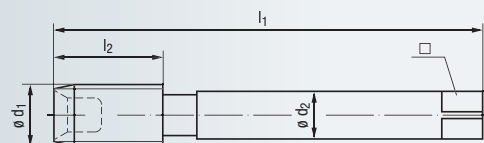
	TIN			TIN
R35	R35	R35	R45	R45
C / 2-3	C / 2-3	C / 2-3	<b>E / 1.5-2</b>	<b>E / 1.5-2</b>
E / 0	E / 0	E / 0 / P	E / 0 / P	E / 0 / P
	max. 2.5 x d <sub>1</sub>		max. 3 x d <sub>1</sub>	
<b>P 1.1-2.1</b> <b>N 2.2</b>	<b>P 1.1-4.1</b> <b>M 1.1-3.1</b> <b>K 2.1-2.2</b> <b>N 2.2, 2.4-5</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1</b> <b>K 2.1</b>	<b>P 1.1-4.1</b> <b>M 1.1-2.1</b> <b>N 2.1</b>	<b>P 1.1-4.1</b> <b>M 1.1-3.1</b> <b>N 1.4-6</b> <b>N 2.1-2, 2.4-5</b> <b>S 1.1</b>

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	ø d <sub>1</sub>	l <sub>1</sub>	mm			□	Tool Identification		C0501000		C0501400		C0503000		C0513500		C0513700	
				l <sub>2</sub>	ø d <sub>2</sub>	□		Enorm 2-STEEL	Flutes	Enorm 2-STEEL TIN	Flutes	Enorm 2-VA	Flutes	Enorm 2-Z/E	Flutes	Enorm 2-Z/E TIN	Flutes		
G 1/16	28	7.72	90	10	6	4.9	6.8	.4034	*	3			*	3					
G 1/8	28	9.73	90	10	7	5.5	8.8	.4035	*	3	*	3	*	3	*	4	●		4
G 1/4	19	13.16	100	15	11	9	11.8	.4036	*	4	*	4	*	4	*	5	●		5
G 3/8	19	16.66	100	15	12	9	15.25	.4037	*	4	*	4	*	4	*	5	●		5
G 1/2	14	20.96	125	17	16	12	19	.4038	*	4	*	4	*	4	*	5	*		5
G 5/8	14	22.91	125	17	18	14.5	21	.4039											
G 3/4	14	26.44	140	20	20	16	24.5	.4040	*	4			*	4	*	5			
G 7/8	14	30.20	150	22	22	18	28.25	.4041											
G 1	11	33.25	160	24	25	20	30.75	.4042	*	5			*	5	*	6			
G 1 1/8	11	37.90	170	24	28	22	35.5	.4043	*	5			*	5					
G 1 1/4	11	41.91	170	25	32	24	39.5	.4044	*	6			*	6					
G 1 3/8	11	44.32	180	27	36	29	41.75	.4045	*	6			*	6					
G 1 1/2	11	47.80	190	27	36	29	45.25	.4046	*	6			*	6					
G 1 5/8	11	52.00	190	27	40	32	49.5	.4047	*	8									
G 1 3/4	11	53.75	190	27	40	32	51	.4048	*	8									
G 2	11	59.61	220	32	45	35	57	.4050	*	8									

**DIN Length • DIN Shank**

With internal chip collector



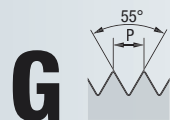
Reduced Shank



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



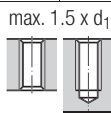
**Whitworth pipe thread  
DIN EN ISO 228**

Class of Fit  
Coating  
Technical Characteristics



"X"	"X"
NE2	TIN
C / 2-3	C / 2-3
P / O 1)	P / O 1)

Thread Depth and Hole Shape



Range of Application

<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 1.1-2.1</b>
<b>K 1.1-4.2</b>	<b>K 1.1-4.2</b>

**Reduced Shank**

Nominal Size ø d <sub>1</sub>	T.P.I.	ø d <sub>1</sub>	l <sub>1</sub>	mm		ø d <sub>2</sub>	□	Tool Identification		Flutes	Flutes
				l <sub>2</sub>	l <sub>2</sub>			Robust 2X-VA	Robust 2X-VA TIN		
G 1	11	33.25	160	30	25	20	30.75	.4042	★	6	
G 1 1/4	11	41.91	170	30	32	24	39.5	.4044	★	6	upon
G 1 1/2	11	47.80	190	32	36	29	45.25	.4046	★	6	
G 1 3/4	11	53.75	190	32	40	32	51	.4048	★	7	request
G 2	11	59.61	220	40	45	35	57	.4050	★	8	
G 2 1/4	11	65.71	275	45	50	39	63.3	.4051	★	8	
G 2 1/2	11	75.18	275	45	50	39	72.8	.4053	★	8	
G 2 3/4	11	81.53	325	50	50	39	79.1	.4054	★	10	
G 3	11	87.88	325	50	50	39	85.5	.4055	★	10	

≥ G2 Shank with grooves for better handling!

1) If possible, use paste lubrication, coating both the tool and the walls of the drilled hole.  
Lubrication with oil is possible only in the vertical machining of blind holes, if the hole is entirely filled with oil.

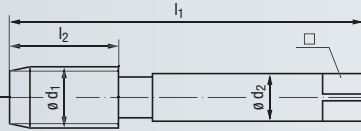
Larger sizes priced upon request.

**The Complete Tool System**

Robust 2X-VA Taps when used with a KSN Type tapping attachment creates the optimal tapping unit!

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G**
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



Reduced Shank



**STEEL**  
Steel materials



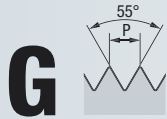
**MS**  
Copper-zinc alloys



**STEEL**  
Steel materials



**VA**  
Stainless steel materials



**Whitworth pipe thread**  
**DIN EN ISO 228**

Class of Fit "X"  
Coating "X"  
Technical Characteristics



Thread Depth and Hole Shape

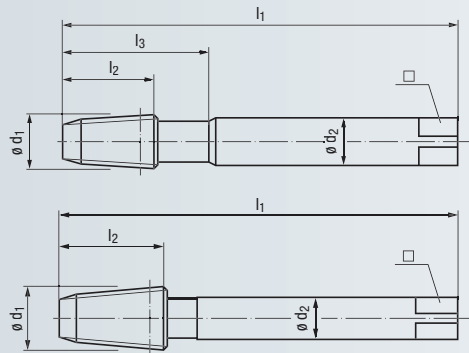
Range of Application

"X"	"X"		
C / 2-3	C / 2-3	B / 4-5	R15
E / 0	E / 0	E / 0	<b>E / 1.5-2</b>
	max. 2 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 2 x d <sub>1</sub>

<b>P 1.1-2.1</b>	<b>N 2.3</b>	<b>P 1.1-2.1</b>	<b>P 1.1-3.1</b>
<b>N 2.3</b>		<b>N 2.2</b>	<b>M 1.1-2.1</b>
			<b>K 2.1</b>
			<b>N 2.4-5</b>

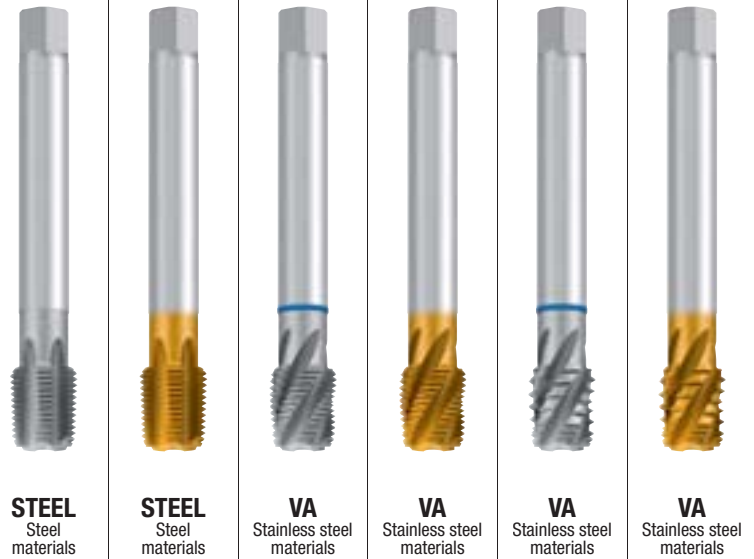
Nominal Size ø d <sub>1</sub>	T.P.I.	ø d <sub>1</sub>	l <sub>1</sub>	mm		ø d <sub>2</sub>	□	Tool Identification		A0101001		A0102501		A0201000		A0463000	
				l <sub>2</sub>	□			Rekord A-STEEL	Flutes	Rekord A-MS	Flutes	Rekord B-STEEL	Flutes	Rekord D-VA/E	Flutes		
G 1/16	28	7.72	63	17	6	4.9	6.8	.4034	*	3	*	3	*	3	*		
G 1/8	28	9.73	63	18	7	5.5	8.8	.4035	*	4	*	4	*	3	*	3	
G 1/4	19	13.16	70	20	11	9	11.8	.4036	*	4	*	4	*	3	*	3	
G 3/8	19	16.66	70	20	12	9	15.25	.4037	*	4	*	4	*	3	*	3	
G 1/2	14	20.96	80	22	16	12	19	.4038	*	4	*	4	*	4	*	4	
G 5/8	14	22.91	80	22	18	14.5	21	.4039	*	4	*	4	*	4	*	4	
G 3/4	14	26.44	90	22	20	16	24.5	.4040	*	4	*	4	*	4	*	4	
G 7/8	14	30.20	90	22	22	18	28.25	.4041	*	5	*	5	*	4	*	4	
G 1	11	33.25	100	25	25	20	30.75	.4042	*	5	*	5	*	4	*	4	
G 1 1/8	11	37.90	125	30	28	22	35.5	.4043	*	5	*	5	*	5	*		
G 1 1/4	11	41.91	125	30	32	24	39.5	.4044	*	6	*	6	*	6	*		
G 1 3/8	11	44.32	125	30	36	29	41.75	.4045	*	6	*	6	*	6	*		
G 1 1/2	11	47.80	140	30	36	29	45.25	.4046	*	6	*	6	*	6	*		
G 1 3/4	11	53.75	140	32	40	32	51	.4048	*	6		6					
G 2	11	59.61	160	36	45	35	57	.4050	*	8							

**Extra Length - ANSI Shank**



Reinforced Shank  
(1/16 - 3/8)

Reduced Shank  
(1/2 - 2)



**STEEL** Steel materials  
**STEEL** Steel materials  
**VA** Stainless steel materials  
**VA** Stainless steel materials  
**VA** Stainless steel materials  
**VA** Stainless steel materials



**NPT**  
 American tapered pipe thread,  
 ANSI/ASME B1.20.1  
 for threads with dryseal material,  
 taper 1:16

Class of Fit  
 Coating  
 Technical Characteristics  
 Range of Application

for threads with dryseal material,  
 taper 1:16

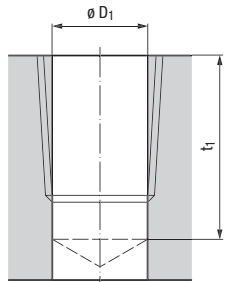
**Tool Identification**

Nominal Size $\phi d_1$	T.P.I.	$l_1$	$l_2$	inch $l_3$	$\phi d_2$	$\square$	Dimens. ID	CW181000		CW181400		CW483000		CW483100		CW493000		CW493100	
								Rekord 2-KEG STEEL	Flutes	Rekord 2-KEG STEEL TIN	Flutes	Rekord 2-KEG R15-VA	Flutes	Rekord 2-KEG R15-VA TIN	Flutes	Rekord 2-KEG R15-VA-AZ	Flutes	Rekord 2-KEG R15-VA-AZ TIN	Flutes
1/16	27	3.543	0.69	1.161	0.3125	0.234	.5763	●	4	●	4	●	3	●	3	●	3	●	3
1/8	27	3.937	0.75	1.299	0.4375	0.328	.5764	●	5	●	5	●	3	●	3	●	3	●	3
1/4	18	3.937	1.06	1.772	0.5625	0.421	.5765	●	5	●	5	●	3	●	3	●	3	●	3
3/8	18	4.331	1.06	1.850	0.7000	0.531	.5766	●	5	●	5	●	3	●	3	●	3	●	3
1/2	14	5.512	1.38	—	0.6875	0.515	.5767	●	5	●	5	●	5	●	5	●	5	●	5
3/4	14	5.512	1.38	—	0.9063	0.679	.5768	●	6	●	6	●	5	●	5	●	5	●	5
1	11 1/2	6.299	1.75	—	1.1250	0.843	.5769	●	6	●	6	—	—	—	—	—	—	—	—
1 1/4	11 1/2	6.693	1.75	—	1.3125	0.984	.5770	●	6	●	6	—	—	—	—	—	—	—	—
1 1/2	11 1/2	7.480	1.75	—	1.5000	1.125	.5771	●	7	●	7	—	—	—	—	—	—	—	—
2	11 1/2	7.874	1.75	—	1.8750	1.406	.5772	●	7	●	7	—	—	—	—	—	—	—	—

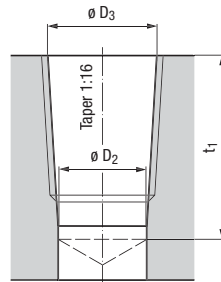
Taper reamers for taper holes 1:16, see page 108.

**Thread hole diameters for tapered pipe thread NPT, taper 1:16**

A) Drill cylindrically without using a reamer



B) Drill cylindrically and prepare tapered hole with reamer

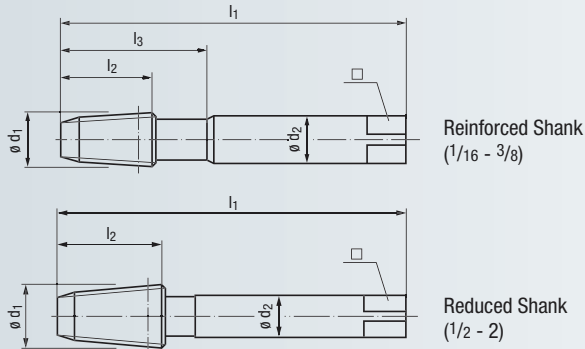


Nominal size $\phi d_1$	T.P.I.	$\phi D_1$	$\phi D_2$	inch $\phi D_3$ (+0.002)	$t_1$
1/16	27	0.2421	0.2343	0.2516	0.4646
1/8	27	0.3346	0.3268	0.3441	0.4685
1/4	18	0.4331	0.4232	0.4472	0.6850
3/8	18	0.5669	0.5571	0.5827	0.6969
1/2	14	0.7008	0.6870	0.7213	0.9094
3/4	14	0.9114	0.8976	0.9319	0.9291
1	11 1/2	1.1437	1.1280	1.1689	1.1181
1 1/4	11 1/2	1.4882	1.4705	1.5138	1.1378
1 1/2	11 1/2	1.7264	1.7106	1.7528	1.1378
2	11 1/2	2.1988	2.1831	2.2268	1.1535

The minimum drilling depth  $t_1$  includes the reach of screw by hand  $L_1$  and the effective depth  $L_3$  to ANSI/ASME B1.20.1 as well as the chamfer of the tap. Additional drilling-down has to be determined by the user according to the construction of the workpiece. For series production it is recommended that the minor thread dia. be made as per B. Special taps are required for blind holes where the minimum depths  $t_1$  as listed in the above table cannot be met. In this case please supply a sketch with blind hole dimensions along with the order.

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT**
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### ANSI Length · ANSI Shank



**STEEL**  
Steel materials

**STEEL**  
Steel materials

**VA**  
Stainless steel materials

**VA**  
Stainless steel materials

**VA**  
Stainless steel materials

**NPT**

Class of Fit

Coating

Technical Characteristics

Range of Application

**American tapered pipe thread, ANSI/ASME B1.20.1 for threads with dryseal material, taper 1:16**

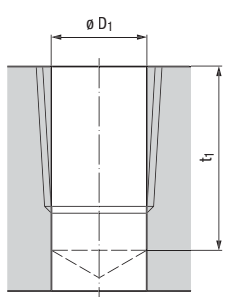
	TIN		TIN	
C/2-3	C/2-3	C/2-3	C/2-3	R15
E/O	E/O	E/O	E/O	C/2-3
P 1.1-2.1	P 1.1-2.1	P 1.1-4.1	P 1.1-4.1	P 1.1-3.1
K 1.1-2.1	K 1.1-2.1	M 1.1-3.1	M 1.1-3.1	M 1.1-3.1
N 2.2-3	N 2.2-3	K 2.1-4.2	K 2.1-4.2	N 2.4-6
		N 2.4-6	N 2.4-6	

Nominal Size ø d <sub>1</sub>	T.P.I.	inch						Dimens. ID	Tool Identification		AW181000		AW181400		AW193000		AW193100		AW483000	
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	□	Rekord KEG STEEL		Flutes	Rekord KEG STEEL TIN	Flutes	Rekord KEG VA-AZ	Flutes	Rekord KEG VA-AZ TIN	Flutes	Rekord KEG R15-VA	Flutes			
1/16	27	2 1/8	2.13	0.69	0.925	0.3125	0.234	.5763	●	4	●	4	●	3	●	3	●	3		
1/8	27	2 1/8	2.13	0.75	0.984	0.4375	0.328	.5764	●	5	●	5	●	3	●	3	●	3		
1/4	18	2 7/16	2.44	1.06	1.280	0.5625	0.421	.5765	●	5	●	5	●	3	●	3	●	3		
3/8	18	2 9/16	2.56	1.06	1.339	0.7000	0.531	.5766	●	5	●	5	●	3	●	3	●	3		
1/2	14	3 1/8	3.13	1.38	—	0.6875	0.515	.5767	●	5	●	5	●	5	●	5	●	5		
3/4	14	3 1/4	3.25	1.38	—	0.9063	0.679	.5768	●	6	●	6	●	5	●	5	●	5		
1	11 1/2	3 3/4	3.75	1.75	—	1.1250	0.843	.5769	●	6	●	6	●	5	●	5	●	5		
1 1/4	11 1/2	4	4.00	1.75	—	1.3125	0.984	.5770	●	6	●	6	●	5	●	5	●	5		
1 1/2	11 1/2	4 1/4	4.25	1.75	—	1.5000	1.125	.5771	●	7	●	7	●	5	●	5	●	5		
2	11 1/2	4 1/2	4.50	1.75	—	1.8750	1.406	.5772	●	7	●	7	●	5	●	5	●	5		

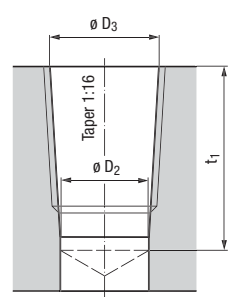
Taper reamers for taper holes 1:16, see page 108

### Thread hole diameters for tapered pipe thread NPT, taper 1:16

A) Drill cylindrically without using a reamer









B) Drill cylindrically and prepare tapered hole with reamer



Nominal size ø d <sub>1</sub>	T.P.I.	inch			
		ø D <sub>1</sub>	ø D <sub>2</sub>	ø D <sub>3</sub> (+0.002)	t <sub>1</sub>
1/16	27	0.2421	0.2343	0.2516	0.4646
1/8	27	0.3346	0.3268	0.3441	0.4685
1/4	18	0.4331	0.4232	0.4472	0.6850
3/8	18	0.5669	0.5571	0.5827	0.6969
1/2	14	0.7008	0.6870	0.7213	0.9094
3/4	14	0.9114	0.8976	0.9319	0.9291
1	11 1/2	1.1437	1.1280	1.1689	1.1181
1 1/4	11 1/2	1.4882	1.4705	1.5138	1.1378
1 1/2	11 1/2	1.7264	1.7106	1.7528	1.1378
2	11 1/2	2.1988	2.1831	2.2268	1.1535

The minimum drilling depth t<sub>1</sub> includes the reach of screw by hand L<sub>1</sub> and the effective depth L<sub>3</sub> to ANSI/ASME B1.20.1 as well as the chamfer of the tap. Additional drilling-down has to be determined by the user according to the construction of the workpiece. For series production it is recommended that the minor thread dia. be made as per B. Special taps are required for blind holes where the minimum depths t<sub>1</sub> as listed in the above table cannot be met. In this case please supply a sketch with blind hole dimensions along with the order.



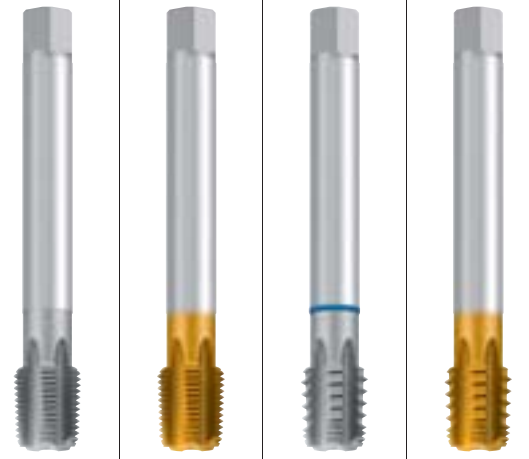
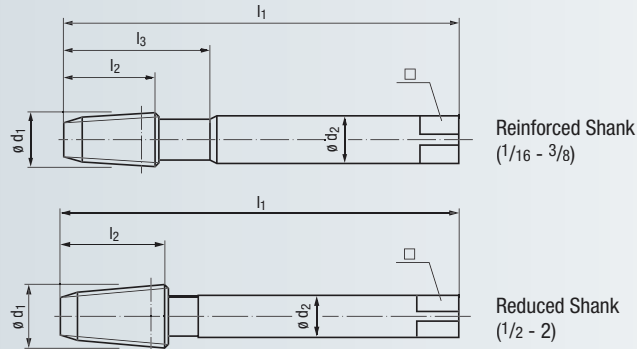
VA Stainless steel materials		VA Stainless steel materials		VA Stainless steel materials		VA Stainless steel materials		NI Nickel alloys										
																		
TIN		TICN				TIN		TICN					Class of Fit					
R15		R15		R15		R15		R10					Coating					
C / 2-3		C / 2-3		C / 2-3		C / 2-3		C / 2-3					Technical Characteristics					
E / O		E / O		E / O		E / O		O / P										
P 1.1-3.1		P 1.1-3.1		P 1.1-3.1		P 1.1-3.1		M 4.1					Range of Application					
M 1.1-3.1		M 1.1-3.1		M 1.1-3.1		M 1.1-3.1		S 2.3, 2.5-6										
AW483100		AW889300		AW493000		AW493100		AW79J400					Tool Identification					
Rekord KEG R15-VA TIN	Flutes	Rekord KEG R15-VA IKZN-TICN	Flutes	Rekord KEG R15-VA-AZ	Flutes	Rekord KEG R15-VA-AZ TIN	Flutes	Rekord KEG R10-NI TICN	Flutes				Dimens. ID	Nominal Size $\varnothing d_1$	T.P.I.			
●	3	●	3	●	3	●	3	●	3				.5763	1/16	27			
●	3	●	3	●	3	●	3	●	3				.5764	1/8	27			
●	3	●	3	●	3	●	3	●	3				.5765	1/4	18			
●	3	●	3	●	3	●	3	●	4				.5766	3/8	18			
●	5	●	5	●	5	●	5	●	4				.5767	1/2	14			
●	5	●	5	●	5	●	5	●	4				.5768	3/4	14			
●	5	●	5	●	5	●	5	●	4				.5769	1	11 1/2			
●	5							●	6				.5770	1 1/4	11 1/2			
●	5							●	6				.5771	1 1/2	11 1/2			
●	7							●	6				.5772	2	11 1/2			

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT**
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



- Product Finder
- Vc
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### Extra Length - ANSI Shank



**STEEL**  
Steel materials

**STEEL**  
Steel materials

**VA**  
Stainless steel materials

**VA**  
Stainless steel materials

## NPTF

Class of Fit

Coating

Technical Characteristics

Range of Application

**American tapered pipe thread, ANSI B1.20.3**  
for threads **without dryseal material**, taper 1:16

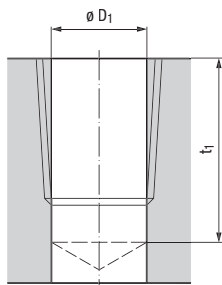
	TIN		TIN
C / 2-3	C / 2-3	C / 2-3	C / 2-3
E / 0	E / 0	E / 0	E / 0
P 1.1-2.1 K 1.1-2.1 N 2.2-3	P 1.1-2.1 K 1.1-2.1 N 2.2-3	P 1.1-4.1 M 1.1-3.1 K 2.1-4.2 N 2.4-6	P 1.1-4.1 M 1.1-3.1 K 2.1-4.2 N 2.4-6

		Tool Identification							CW181000		CW181400		CW193000		CW193100	
Nominal Size $\phi d_1$	T.P.I.	$l_1$	$l_2$	inch $l_3$	$\phi d_2$	$\square$	Dimens. ID	Rekord 2-KEG STEEL	Flutes	Rekord 2-KEG STEEL TIN	Flutes	Rekord 2-KEG VA-AZ	Flutes	Rekord 2-KEG VA-AZ TIN	Flutes	
								1/16	27	3.543	0.69	1.161	0.3125	0.234	.5782	●
1/8	27	3.937	0.75	1.299	0.4375	0.328	.5783	●	5	●	5	●	3	●	3	
1/4	18	3.937	1.06	1.772	0.5625	0.421	.5784	●	5	●	5	●	3	●	3	
3/8	18	4.331	1.06	1.850	0.7000	0.531	.5785	●	5	●	5	●	3	●	3	
1/2	14	5.512	1.38	—	0.6875	0.515	.5786	●	5	●	5	●	5	●	5	
3/4	14	5.512	1.38	—	0.9063	0.679	.5787	●	6	●	6	●	5	●	5	
1	11 1/2	6.299	1.75	—	1.1250	0.843	.5788	●	6	●	6	●	5	●	5	
1 1/4	11 1/2	6.693	1.75	—	1.3125	0.984	.5789	●	6	●	6	●	5	●	5	
1 1/2	11 1/2	7.480	1.75	—	1.5000	1.125	.5790	●	7	●	7	●	5	●	5	
2	11 1/2	7.874	1.75	—	1.8750	1.406	.5791	●	7	●	7	●	7	●	7	

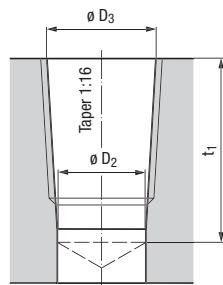
Taper reamers for taper holes 1:16, see page 108.

### Thread hole diameters for tapered pipe thread NPTF, taper 1:16

A) Drill cylindrically without using a reamer



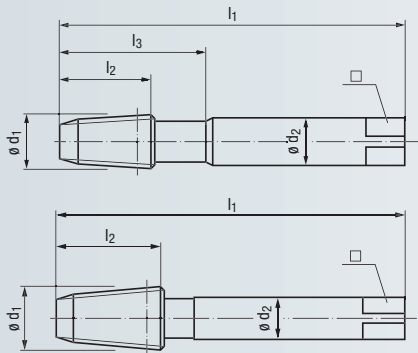
B) Drill cylindrically and prepare tapered hole with reamer



Nominal size $\phi d_1$	T.P.I.	inch			
		$\phi D_1$	$\phi D_2$	$\phi D_3$ (+0.002)	$t_1$
1/16	27	0.2402	0.2343	0.2524	0.4646
1/8	27	0.3327	0.3268	0.3449	0.4685
1/4	18	0.4291	0.4232	0.4488	0.6850
3/8	18	0.5630	0.5571	0.5843	0.6969
1/2	14	0.6929	0.6870	0.7217	0.9094
3/4	14	0.9055	0.8976	0.9323	0.9291
1	11 1/2	1.1319	1.1280	1.1701	1.1181
1 1/4	11 1/2	1.4764	1.4705	1.5150	1.1378
1 1/2	11 1/2	1.7224	1.7106	1.7539	1.1378
2	11 1/2	2.1949	2.1831	2.2280	1.1535

The minimum drilling depth  $t_1$  includes the reach of screw by hand  $L_1$  and the effective depth  $L_3$  to ANSI B1.20.3 as well as the chamfer of the tap. Additional drilling-down has to be determined by the user according to the construction of the workpiece. For series production it is recommended that the minor thread dia. be made as per B. Special taps are required for blind holes where the minimum depths  $t_1$  as listed in the above table cannot be met. In this case please supply a sketch with blind hole dimensions along with the order.

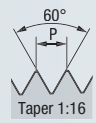
**ANSI Length • ANSI Shank**



Reinforced Shank  
(1/16 - 3/8)

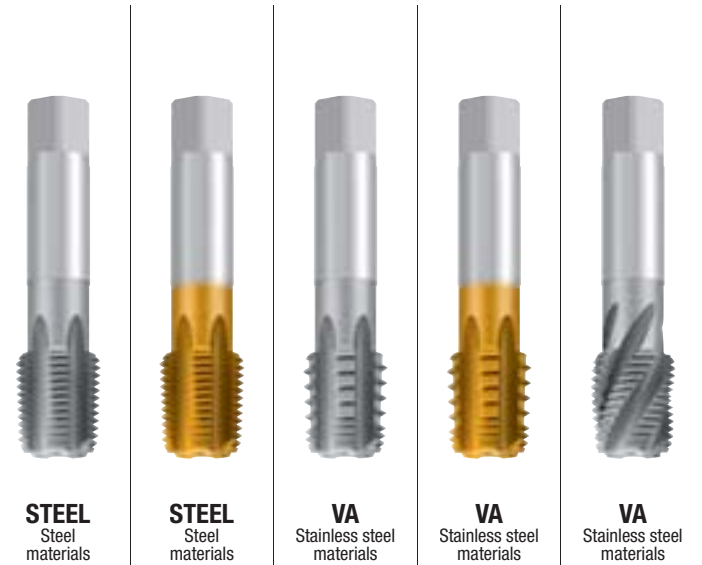
Reduced Shank  
(1/2 - 2)

**NPTF**



**American tapered pipe thread,  
ANSI B1.20.3**  
for threads **without dryseal material**,  
taper 1:16

Class of Fit  
Coating  
Technical Characteristics  
Range of Application



**STEEL**  
Steel materials

**STEEL**  
Steel materials

**VA**  
Stainless steel materials

**VA**  
Stainless steel materials

**VA**  
Stainless steel materials

	TIN		TIN	
C / 2-3	C / 2-3	C / 2-3	C / 2-3	R15
E / 0	E / 0	E / 0	E / 0	E / 0
P 1.1-2.1	P 1.1-2.1	P 1.1-4.1	P 1.1-4.1	P 1.1-3.1
K 1.1-2.1	K 1.1-2.1	M 1.1-3.1	M 1.1-3.1	M 1.1-3.1
N 2.2-3	N 2.2-3	K 2.1-4.2	K 2.1-4.2	
		N 2.4-6	N 2.4-6	

**Tool Identification**

Nominal Size ø d <sub>1</sub>	T.P.I.	inch			ø d <sub>2</sub>	□	Dimens. ID	AW181000		AW181400		AW193000		AW193100		AW483000	
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>				Rekord KEG STEEL	Flutes	Rekord KEG STEEL TIN	Flutes	Rekord KEG VA-AZ	Flutes	Rekord KEG VA-AZ TIN	Flutes	Rekord KEG R15-VA	Flutes
1/16	27	2 1/8	2.13	0.69	0.925	0.3125	0.234	●	4	●	4	●	3	●	3	●	3
1/8	27	2 1/8	2.13	0.75	0.984	0.4375	0.328	●	5	●	5	●	3	●	3	●	3
1/4	18	2 7/16	2.44	1.06	1.280	0.5625	0.421	●	5	●	5	●	3	●	3	●	3
3/8	18	2 9/16	2.56	1.06	1.339	0.7000	0.531	●	5	●	5	●	3	●	3	●	3
1/2	14	3 1/8	3.13	1.38	—	0.6875	0.515	●	5	●	5	●	5	●	5	●	5
3/4	14	3 1/4	3.25	1.38	—	0.9063	0.679	●	6	●	6	●	5	●	5	●	5
1	11 1/2	3 3/4	3.75	1.75	—	1.1250	0.843	●	6	●	6	●	5	●	5	●	5
1 1/4	11 1/2	4	4.00	1.75	—	1.3125	0.984	●	6	●	6	●	5	●	5	●	5
1 1/2	11 1/2	4 1/4	4.25	1.75	—	1.5000	1.125	●	7	●	7	●	5	●	5	●	5
2	11 1/2	4 1/2	4.50	1.75	—	1.8750	1.406	●	7	●	7	●	7	●	7	●	7

Taper reamers for taper holes 1:16, see page 108.

Product Finder

Vc

UNC

UNF

UNEF

UN-8

M

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

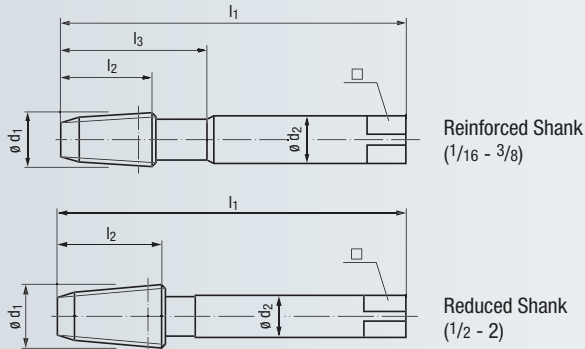
Accessories

Tech. Info



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### ANSI Length · ANSI Shank



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials

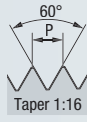


**VA**  
Stainless steel materials



**NI**  
Nickel alloys

# NPTF



**American tapered pipe thread, ANSI B1.20.3**  
for threads **without dryseal material**, taper 1:16

Class of Fit  
Coating  
Technical Characteristics  
Range of Application

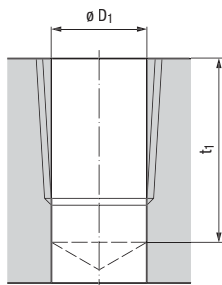
TIN	TICN		TIN	TICN
R15	R15	R15	R15	R10
C/2-3	C/2-3	C/2-3	C/2-3	C/2-3
E/O	E/O	E/O	E/O	O/P
<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b>	<b>M 4.1</b>
<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>M 1.1-3.1</b>	<b>S 2.3, 2.5-6</b>

Nominal Size ø d <sub>1</sub>	T.P.I.	inch						Dimens. ID	Tool Identification		AW483100		AW889300		AW493000		AW493100		AW79J400	
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	□	Rekord KEG R15-VA TIN		Flutes	Rekord KEG R15-VA IKZN-TICN	Flutes	Rekord KEG R15-VA-AZ	Flutes	Rekord KEG R15-VA-AZ TIN	Flutes	Rekord KEG R10-NI TICN	Flutes			
1/16	27	2 1/8	2.13	0.69	0.925	0.3125	0.234	.5782	●	3	●	3	●	3	●	3	●	3		
1/8	27	2 1/8	2.13	0.75	0.984	0.4375	0.328	.5783	●	3	●	3	●	3	●	3	●	3		
1/4	18	2 7/16	2.44	1.06	1.280	0.5625	0.421	.5784	●	3	●	3	●	3	●	3	●	3		
3/8	18	2 9/16	2.56	1.06	1.339	0.7000	0.531	.5785	●	3	●	3	●	3	●	3	●	4		
1/2	14	3 1/8	3.13	1.38	—	0.6875	0.515	.5786	●	5	●	5	●	5	●	5	●	4		
3/4	14	3 1/4	3.25	1.38	—	0.9063	0.679	.5787	●	5	●	5	●	5	●	5	●	4		
1	11 1/2	3 3/4	3.75	1.75	—	1.1250	0.843	.5788	●	5	●	5	●	5	●	5	●	4		
1 1/4	11 1/2	4	4.00	1.75	—	1.3125	0.984	.5789	●	5	●	5	●	5	●	5	●	6		
1 1/2	11 1/2	4 1/4	4.25	1.75	—	1.5000	1.125	.5790	●	5	●	5	●	5	●	5	●	6		
2	11 1/2	4 1/2	4.50	1.75	—	1.8750	1.406	.5791	●	7	●	7	●	7	●	7	●	6		

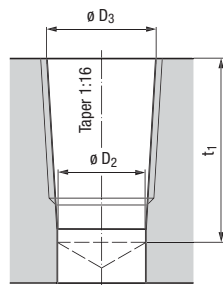
Taper reamers for taper holes 1:16, see page 108.

### Thread hole diameters for tapered pipe thread NPTF, taper 1:16

A) Drill cylindrically without using a reamer



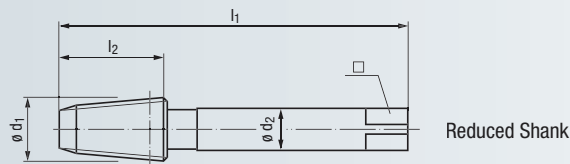
B) Drill cylindrically and prepare tapered hole with reamer



Nominal size ø d <sub>1</sub>	T.P.I.	inch			
		ø D <sub>1</sub>	ø D <sub>2</sub>	ø D <sub>3</sub> (+0.002)	t <sub>1</sub>
1/16	27	0.2402	0.2343	0.2524	0.4646
1/8	27	0.3327	0.3268	0.3449	0.4685
1/4	18	0.4291	0.4232	0.4488	0.6850
3/8	18	0.5630	0.5571	0.5843	0.6969
1/2	14	0.6929	0.6870	0.7217	0.9094
3/4	14	0.9055	0.8976	0.9323	0.9291
1	11 1/2	1.1319	1.1280	1.1701	1.1181
1 1/4	11 1/2	1.4764	1.4705	1.5150	1.1378
1 1/2	11 1/2	1.7224	1.7106	1.7539	1.1378
2	11 1/2	2.1949	2.1831	2.2280	1.1535

The minimum drilling depth t<sub>1</sub> includes the reach of screw by hand L<sub>1</sub> and the effective depth L<sub>3</sub> to ANSI B1.20.3 as well as the chamfer of the tap. Additional drilling-down has to be determined by the user according to the construction of the workpiece. For series production it is recommended that the minor thread dia. be made as per B. Special taps are required for blind holes where the minimum depths t<sub>1</sub> as listed in the above table cannot be met. In this case please supply a sketch with blind hole dimensions along with the order.

## DIN Length · DIN Shank



**STEEL**  
Steel materials

# Rc (BSPT)

**Tapered Whitworth pipe thread, DIN EN ISO 10226-2 and ISO 7-1** where pressure-tight joints are made on the threads, taper 1:16



Class of Fit  
Coating  
Technical Characteristics



Range of Application

C / 2-3

E / O

P 1.1-2.1

K 1.1-2.1

N 2.2-3

### Tool Identification

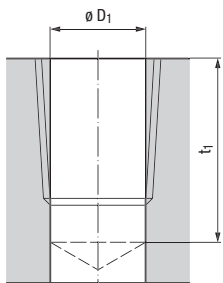
A0181000

Nominal Size $\phi d_1$	T.P.I.	$l_1$	$l_2$	mm $\phi d_2$	$\square$	Dimens. ID	Rekord KEG STEEL		Flutes						
							★	★							
Rc 1/16	28	63	12	6	4.9	.4114	★	★	4						
Rc 1/8	28	63	12	7	5.5	.4115	★	★	5						
Rc 1/4	19	63	18	11	9	.4116	★	★	5						
Rc 3/8	19	70	18	12	9	.4117	★	★	5						
Rc 1/2	14	80	23	16	12	.4118	★	★	5						
Rc 3/4	14	100	24	20	16	.4119	★	★	6						
Rc 1	11	110	30	25	20	.4120	★	★	6						

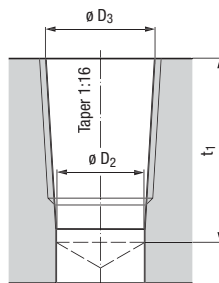
Taper reamers for taper holes 1:16, see page 108.

### Thread hole diameters for tapered pipe thread Rc (BSPT), taper 1:16

A) Drill cylindrically without using a reamer



B) Drill cylindrically and prepare tapered hole with reamer



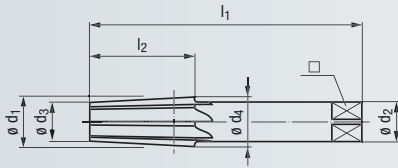
Nominal size $\phi d_1$	T.P.I.	mm			
		$\phi D_1$	$\phi D_2$	$\phi D_3$ (JS11)	$t_1$
Rc 1/16	28	6.15	6.10	6.56	11.1
Rc 1/8	28	8.15	8.10	8.57	11.1
Rc 1/4	19	10.85	10.75	11.45	16.3
Rc 3/8	19	14.30	14.25	14.95	16.7
Rc 1/2	14	17.80	17.70	18.63	22.3
Rc 3/4	14	23.20	23.10	24.12	23.6
Rc 1	11	29.20	29.10	30.29	28.3

The minimum drilling depth  $t_1$  includes the reach of screw by hand  $L_1$  and the effective depth  $L_3$  to DIN EN ISO 10226-2 and ISO 7-1 as well as the chamfer of the tap. Additional drilling-down has to be determined by the user according to the construction of the workpiece. For series production it is recommended that the minor thread dia. be made as per B. Special taps are required for blind holes where the minimum depths  $t_1$  as listed in the above table cannot be met. In this case please supply a sketch with blind hole dimensions along with the order.

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### For the preparation of a tapered hole

### For tapered pipe threads NPT, NPTF, Rc (BSPT)



#### Technical Characteristics

L7

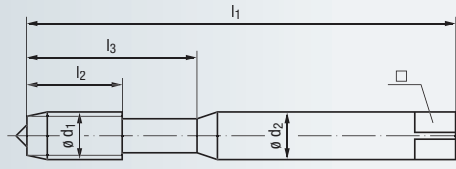
		Tool Identification		G0037165		G0037175							
Nominal Size ø d <sub>1</sub>	ø d <sub>3</sub> (-0.05)	ø d <sub>4</sub>	mm		ø d <sub>2</sub>	□	Dimens. ID	KEG-RB 1:16 Form A	Flutes	KEG-RB 1:16 Form B	Flutes		
			l <sub>1</sub>	l <sub>2</sub>				★		★			
1/16	5.95	7	70	17	6	4.9	.5763	★	6	★	6		
1/8	8.05	9.1	70	17	7	5.5	.5764	★	6	★	6		
1/4	10.3	12	80	27	11	9	.5765	★	6	★	6		
3/8	13.75	15.4	85	27	12	9	.5766	★	8	★	8		
1/2	16.95	19.1	95	35	16	12	.5767	★	8	★	8		
3/4	22.25	24.5	105	35	20	16	.5768	★	10	★	10		
1	28	30.7	130	43	25	20	.5769	★	10	★	10		
1 1/4	36.75	39.5	140	44	32	24	.5770	★	12	★	12		
1 1/2	42.8	45.6	150	45	36	29	.5771	★	12	★	12		
2	54.8	57.7	160	46	45	35	.5772	★	14	★	14		

Please note: If needed, the reamers can be fitted to the required hole depth by shortening the cutting part.

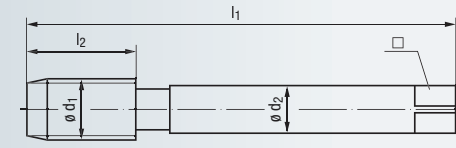


**DIN Length · ANSI Shank**

Overall length acc. to DIN 371, DIN 376

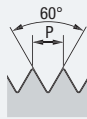


Reinforced Shank  
(STI-No.4 - STI 5/16)



Reduced Shank  
(STI 3/8 - STI 3/4)

**STI-UNC**



Unified coarse thread  
ASME B18.29.1  
for wire thread inserts

Class of Fit  
Coating  
Technical Characteristics



Thread Depth and Hole Shape

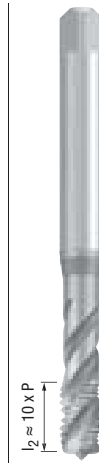
Range of Application



**VA**  
Stainless steel materials



**TI**  
Titanium



**Z**  
CNC-controlled machines

<b>3B</b>	<b>3BX</b>	<b>3B</b>
NT	NT2	
R15	R45	
B / 4-5	C / 2-3	<b>E / 1.5-2</b>
E / O / P	E / O / P	E / O / P
max. 3 x d <sub>1</sub>	max. 2 x d <sub>1</sub>	max. 3 x d <sub>1</sub>
<b>P 1.1-3.1</b>	<b>P 4.1-5.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 3.1-4.1</b>	<b>M 1.1-2.1</b>
<b>K 2.1</b>	<b>K 2.2</b>	<b>N 2.1</b>
<b>N 1.5, 2.4-5</b>	<b>N 2.4-5, 2.7</b>	<b>S 1.1-2.2, 2.4</b>

**Reinforced Shank**

Nominal Size ø d <sub>1</sub>	T.P.I.	ø d <sub>1</sub>	l <sub>1</sub>	inch			ø d <sub>2</sub>	□	Tool Identification		BU203010		BU456011		BU513510	
				l <sub>2</sub>	l <sub>3</sub>	l <sub>3</sub>			Rekord 1B-VA	Flutes	Rekord 1D-TI	Flutes	Enorm 1-Z/E	Flutes		
STI-No. 4	40	0.1445	2.205	0.472	0.787	0.141	0.110	0.1220	.5611	●	3	●	3	●	3	
STI-No. 5	40	0.1575	2.480	0.512	0.827	0.168	0.131	0.1339	.5612	●	3	●	3	●	3	
STI-No. 6	32	0.1786	2.756	0.512	0.984	0.194	0.152	0.1496	.5613	●	3	●	3	●	3	
STI-No. 8	32	0.2046	3.150	0.512	1.142	0.220	0.165	0.1732	.5614	●	3	●	3	●	3	
STI-No. 10	24	0.2441	3.150	0.669	1.181	0.255	0.191	0.2047	.5615	●	3	●	3	●	3	
STI-No. 12	24	0.2701	3.543	0.669	1.260	0.318	0.238	0.2283	.5616	●	3	●	3	●	3	
STI 1/4	20	0.3150	3.543	0.787	1.378	0.318	0.238	0.2638	.5617	●	3	●	3	●	3	
STI 5/16	18	0.3847	3.937	0.866	1.535	0.381	0.286	0.3307	.5618	●	3	●	3	●	3	

**Reduced Shank**

Nominal Size ø d <sub>1</sub>	T.P.I.	ø d <sub>1</sub>	l <sub>1</sub>	inch			ø d <sub>2</sub>	□	Tool Identification		CU203010		CU456011		CU513510	
				l <sub>2</sub>	l <sub>3</sub>	l <sub>3</sub>			Rekord 2B-VA	Flutes	Rekord 2D-TI	Flutes	Enorm 2-Z/E	Flutes		
STI 3/8	16	0.4562	3.937	0.866	—	0.367	0.275	0.3937	.5619	●	3	●	3	●	5	
STI 7/16	14	0.5303	4.331	1.024	—	0.429	0.322	0.4567	.5620	●	3	●	3	●	4	
STI 1/2	13	0.5999	4.331	1.063	—	0.480	0.360	0.5236	.5621	●	3	●	3	●	4	
STI 9/16	12	0.6708	4.921	1.024	—	0.542	0.406	0.5866	.5622	●	3	●	3	●	5	
STI 5/8	11	0.7431	4.921	1.181	—	0.590	0.442	0.6496	.5623	●	3	●	3	●	5	
STI 3/4	10	0.8799	5.512	1.260	—	0.697	0.523	0.7776	.5624	●	3	●	3	●	5	

Product Finder

v<sub>c</sub>

UNC

UNF

UNEF

UN-8

M

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

PT

NPTF

Rc (BSPT)

**STI**

SELF-LOCK

Accessories

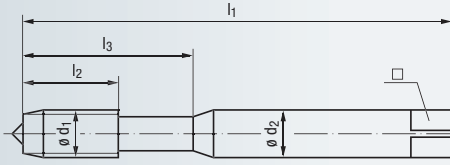
Tech. Info



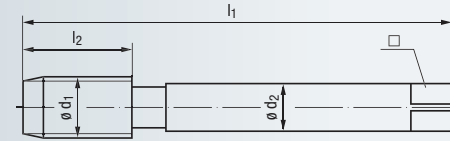
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

Overall length acc. to DIN 371, DIN 374



Reinforced Shank  
(STI-No.4 - STI 5/16)



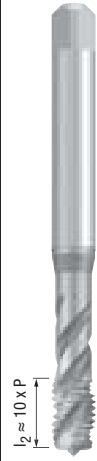
Reduced Shank  
(STI 3/8 - STI 3/4)



**VA**  
Stainless steel materials



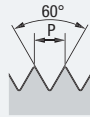
**TI**  
Titanium



l<sub>2</sub> ≈ 10 x P

**Z**  
CNC-controlled machines

# STI-UNF



**Unified fine thread**  
**ASME B18.29.1**  
for wire thread inserts

Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application

<b>3B</b>	<b>3BX</b>	<b>3B</b>
NT	NT2	
B / 4-5	R15	R45
E / O / P	C / 2-3	<b>E / 1.5-2</b>
	E / O / P	E / O / P
max. 3 x d <sub>1</sub>	max. 2 x d <sub>1</sub>	max. 3 x d <sub>1</sub>
<b>P 1.1-3.1</b>	<b>P 4.1-5.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-2.1</b>	<b>M 3.1-4.1</b>	<b>M 1.1-2.1</b>
<b>K 2.1</b>	<b>K 2.2</b>	<b>N 2.1</b>
<b>N 1.5, 2.4-5</b>	<b>N 2.4-5, 2.7</b>	
	<b>S 1.1-2.2, 2.4</b>	

### Reinforced Shank

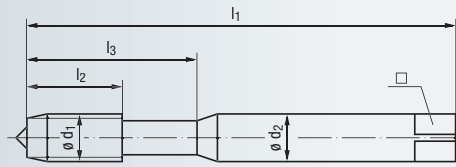
Nominal Size ø d <sub>1</sub>	T.P.I.	ø d <sub>1</sub>	l <sub>1</sub>	inch			ø d <sub>2</sub>	□	Tool Identification		BU203010		BU456011		BU513510	
				l <sub>2</sub>	l <sub>3</sub>	l <sub>3</sub>			Rekord 1B-VA	Flutes	Rekord 1D-TI	Flutes	Enorm 1-Z/E	Flutes		
STI-No. 4	48	0.1391	2.205	0.472	0.787	0.141	0.110	0.1181	.5633	●	3	●	3	●	3	
STI-No. 6	40	0.1705	2.480	0.512	0.827	0.168	0.131	0.1457	.5635	●	3	●	3	●	3	
STI-No. 8	36	0.2001	3.150	0.512	1.142	0.220	0.165	0.1732	.5636	●	3	●	3	●	3	
STI-No. 10	32	0.2306	3.150	0.512	1.181	0.255	0.191	0.2008	.5637	●	3	●	3	●	3	
STI 1/4	28	0.2964	3.543	0.669	1.260	0.318	0.238	0.2598	.5639	●	3	●	3	●	3	
STI 5/16	24	0.3666	3.937	0.709	1.535	0.381	0.286	0.3248	.5640	●	4	●	3	●	3	

### Reduced Shank

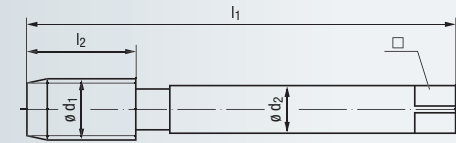
Nominal Size ø d <sub>1</sub>	T.P.I.	ø d <sub>1</sub>	l <sub>1</sub>	inch			ø d <sub>2</sub>	□	Tool Identification		CU203010		CU456011		CU513510	
				l <sub>2</sub>	l <sub>3</sub>	l <sub>3</sub>			Rekord 2B-VA	Flutes	Rekord 2D-TI	Flutes	Enorm 2-Z/E	Flutes		
STI 3/8	24	0.4291	3.937	0.709	—	0.323	0.242	0.3858	.5641	●	4	●	3	●	4	
STI 7/16	20	0.5025	3.937	0.866	—	0.367	0.275	0.4528	.5642	●	3	●	3	●	5	
STI 1/2	20	0.5650	3.937	0.866	—	0.429	0.322	0.5157	.5643	●	3	●	3	●	5	
STI 9/16	18	0.6347	3.937	0.866	—	0.480	0.360	0.5787	.5644			●	3			
STI 5/8	18	0.6972	4.331	0.984	—	0.542	0.406	0.6398	.5645			●	4	●	5	
STI 3/4	16	0.8312	4.921	0.984	—	0.652	0.489	0.7677	.5646			●	4	●	5	



**DIN Length · DIN Shank**

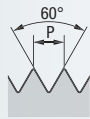


Reinforced Shank  
(STI-M2.5 - STI-M8)



Reduced Shank  
(STI-M10 - STI-M20)

**STI-M**



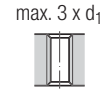
ISO Metric coarse thread  
DIN 8140-2  
for wire thread inserts

Class of Fit  
Coating  
Technical Characteristics

6H mod.  
NT  
B / 4-5  
E / O / P

6H mod.  
GLT-8  
B / approx. 3  
E / O

Thread Depth  
and Hole Shape



Range of Application

P 1.1-3.1  
M 1.1-2.1  
K 2.1  
N 1.5, 2.4-5

**Reinforced Shank**

								Tool Identification		B0203000		B0204500		B020S800	
Nominal Size ø d <sub>1</sub>	P	ø d <sub>1</sub>	l <sub>1</sub>	mm		ø d <sub>2</sub>	□	Image	Dimens. ID	Rekord 1B-VA	Flutes	Rekord 1B-AL	Flutes	Rekord 1B-AL GLT-8	Flutes
				l <sub>2</sub>	l <sub>3</sub>					★		★		★	
STI-M 2.5	0.45	3.085	56	11	18	3.5	2.7	2.65	.0965	●	3	★	2	★	2
STI-M 3	0.5	3.650	63	10	21	4.5	3.4	3.15	.0966	●	3	★	2	★	2
STI-M 4	0.7	4.910	70	12	25	6	4.9	4.2	.0968	●	3	★	2	★	2
STI-M 5	0.8	6.040	80	13	30	6	4.9	5.25	.0970	●	3	★	2	★	2
STI-M 6	1	7.300	90	17	35	8	6.2	6.3	.0971	●	3	★	2	★	2
STI-M 8	1.25	9.624	100	18	39	10	8	8.4	.0973	●	3	★	3	★	3

**Reduced Shank**

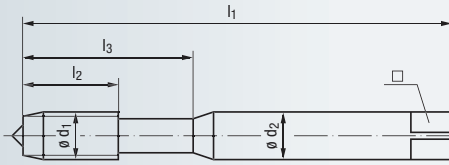
								Tool Identification		C0203000		C0204500		C020S800	
Nominal Size ø d <sub>1</sub>	P	ø d <sub>1</sub>	l <sub>1</sub>	mm		ø d <sub>2</sub>	□	Image	Dimens. ID	Rekord 2B-VA	Flutes	Rekord 2B-AL	Flutes	Rekord 2B-AL GLT-8	Flutes
				l <sub>2</sub>	l <sub>3</sub>					★		★		★	
STI-M 10	1.5	11.948	100	22	—	9	7	10.5	.0975	●	3	★	3	★	3
STI-M 12	1.75	14.274	110	26	—	11	9	12.5	.0977	●	3	★	3	★	3
STI-M 14	2	16.598	110	27	—	12	9	14.5	.0978	●	3	★	3		
STI-M 16	2	18.598	125	27	—	14	11	16.5	.0979	●	3	★	3		
STI-M 18	2.5	21.248	140	32	—	18	14.5	18.75	.0980	●	4	★	4		
STI-M 20	2.5	23.248	160	34	—	18	14.5	20.75	.0981	●	4	★	4		

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI**
- SELF-LOCK
- Accessories
- Tech. Info

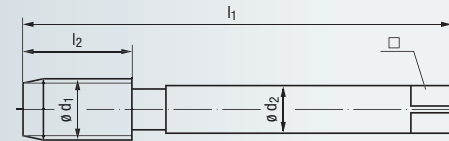


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



Reinforced Shank  
(STI-M2.5 - STI-M8)



Reduced Shank  
(STI-M10 - STI-M20)



**AL**  
Aluminium wrought alloys



**Z**  
CNC-controlled machines



**Z**  
CNC-controlled machines

# STI-M



ISO Metric coarse thread  
**DIN 8140-2**  
for wire thread inserts

Class of Fit  
Coating  
Technical Characteristics

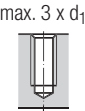
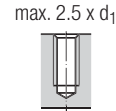


Thread Depth  
and Hole Shape

6H mod.  
GLT-8  
R45  
C / 2-3  
E / O

6H mod.  
R45  
C / 2-3  
E / O / P

6H mod.  
R45  
**E / 1.5-2**  
E / O / P



Range of Application

**N 1.1-4**

**P 1.1-4.1**  
**M 1.1-2.1**  
**N 2.1**

**P 1.1-4.1**  
**M 1.1-2.1**  
**N 2.1**

### Reinforced Shank

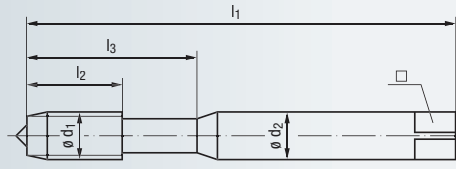
								Tool Identification		B050S800		B0503500		B0513500	
Nominal Size ø d <sub>1</sub>	P	ø d <sub>1</sub>	l <sub>1</sub>	mm l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	□		Dimens. ID	Enorm 1-AL GLT-8	Flutes	Enorm 1-Z	Flutes	Enorm 1-Z/E	Flutes
STI-M 2.5	0.45	3.085	56	5	18	3.5	2.7		<b>.0965</b>	★	2	★	3	●	3
STI-M 3	0.5	3.650	63	5	21	4.5	3.4		<b>.0966</b>	★	2	★	3	●	3
STI-M 4	0.7	4.910	70	8	25	6	4.9		<b>.0968</b>	★	2	★	3	●	3
STI-M 5	0.8	6.040	80	8	30	6	4.9		<b>.0970</b>	★	2	★	3	●	3
STI-M 6	1	7.300	90	10	35	8	6.2		<b>.0971</b>	★	2	★	3	●	3
STI-M 8	1.25	9.624	100	16	39	10	8		<b>.0973</b>	★	2	★	3	●	3

### Reduced Shank

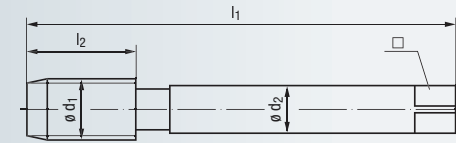
								Tool Identification		C050S800		C0503500		C0513500	
Nominal Size ø d <sub>1</sub>	P	ø d <sub>1</sub>	l <sub>1</sub>	mm l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	□		Dimens. ID	Enorm 2-AL GLT-8	Flutes	Enorm 2-Z	Flutes	Enorm 2-Z/E	Flutes
STI-M 10	1.5	11.948	100	15	—	9	7		<b>.0975</b>	★	3	★	5	●	5
STI-M 12	1.75	14.274	110	20	—	11	9		<b>.0977</b>	★	3	★	4	●	4
STI-M 14	2	16.598	110	20	—	12	9		<b>.0978</b>						
STI-M 16	2	18.598	125	20	—	14	11		<b>.0979</b>			★	5	●	5
STI-M 18	2.5	21.248	140	27	—	18	14.5		<b>.0980</b>						
STI-M 20	2.5	23.248	160	30	—	18	14.5		<b>.0981</b>			★	5	●	5

**DIN Length · ANSI Shank**

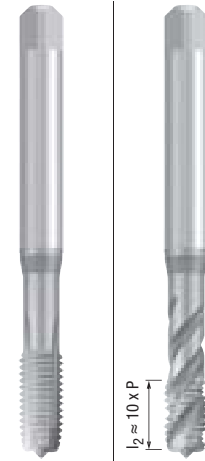
Overall length acc. to DIN 371, DIN 376



Reinforced Shank  
(LK 1/4 - LK 3/8)



Reduced Shank  
(LK 1/2)

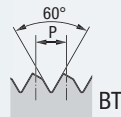


**STEEL**  
Steel materials

**Z**  
CNC-controlled machines

**LK-UNC**

Unified SELF-LOCK coarse thread  
EMUGE standard



Type  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

Range of Application

Type	BT	BT
Coating		
Technical Characteristics	B / 4-5	R45
	E / O	E / 1.5-2
Thread Depth and Hole Shape	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>
Range of Application	P 1.1-2.1 N 2.2	P 1.1-4.1 M 1.1-2.1 N 2.1

**Reinforced Shank**

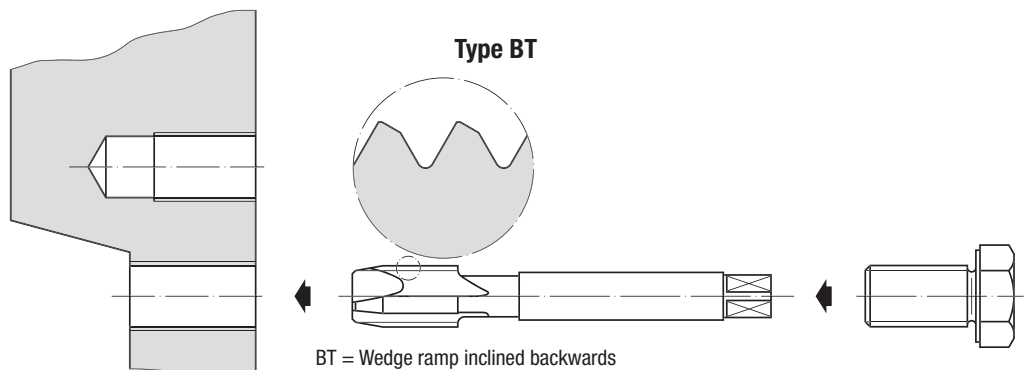
Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			ø d <sub>2</sub>	□	Tool Identification		BU201000		BU513500	
				l <sub>3</sub>	l <sub>3</sub>	l <sub>3</sub>			Rekord 1B-STEEL	Flutes	Enorm 1-Z/E	Flutes		
LK 1/4	20	3.150	0.669	1.181	0.255	0.191	0.2087	.5662	●	3	●	3		
LK 5/16	18	3.543	0.787	1.378	0.318	0.238	0.2677	.5663	●	3	●	3		
LK 3/8	16	3.937	0.866	1.535	0.381	0.286	0.3268	.5664	●	3	●	3		

**Reduced Shank**

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			ø d <sub>2</sub>	□	Tool Identification		CU201000		CU513500	
				l <sub>3</sub>	l <sub>3</sub>	l <sub>3</sub>			Rekord 2B-STEEL	Flutes	Enorm 2-Z/E	Flutes		
LK 1/2	13	4.331	0.984	—	0.367	0.275	0.4375	.5666	●	3	●	4		

**The alternative in locking thread technology and thread stripping prevention.**

- Self-locking internal thread form
- For standard external fasteners
- Eliminates need for costly and ineffective inserts or locking parts
- Ease of assembly
- Provides uniform distribution of load over the entire thread length
- Reduces probability of thread stripping in aluminum and other soft materials



Product Finder

v<sub>c</sub>

UNC

UNF

UNEF

UN-8

M

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

PT

NPTF

Rc (BSPT)

STI

**SELF-LOCK**

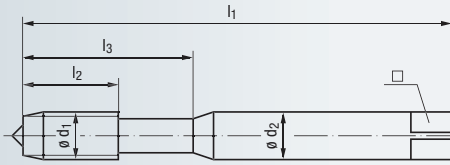
Accessories

Tech. Info

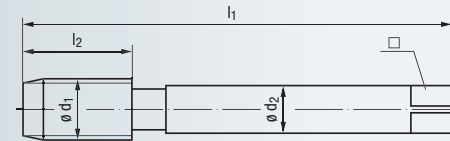


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank



Reinforced Shank  
(LK-M3 - LK-M10)



Reduced Shank  
(LK-M12 - LK-M24)



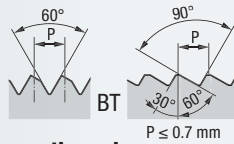
**VA**  
Stainless steel materials



**Z**  
CNC-controlled machines

## LK-M

Metric SELF-LOCK coarse thread  
EMUGE standard



Type  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application

Type	BT	BT
Coating	NT	
Technical Characteristics	B / 4-5	R45
	E / O / P	<b>E / 1.5-2</b>
		E / O / P
Thread Depth and Hole Shape	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>
Range of Application	<b>P 1.1-3.1</b> <b>M 1.1-2.1</b> <b>K 2.1</b> <b>N 1.5, 2.4-5</b>	<b>P 1.1-4.1</b> <b>M 1.1-2.1</b> <b>N 2.1</b>

### Reinforced Shank

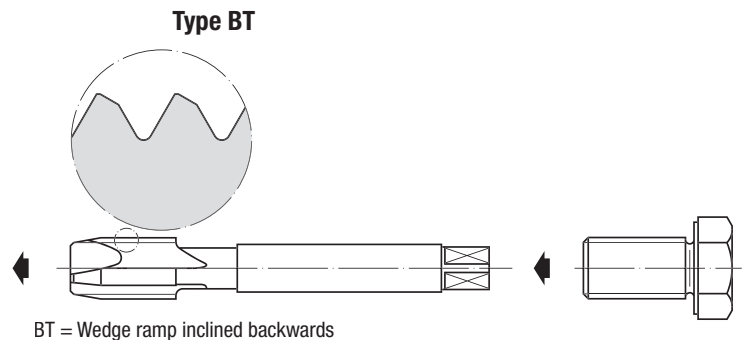
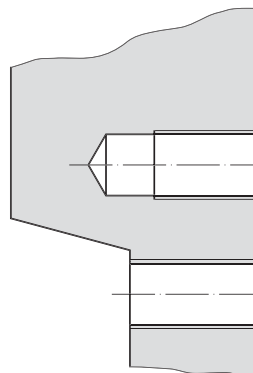
								Tool Identification		B0203000		B0513500					
Nominal Size $\phi d_1$	P	l <sub>1</sub>	mm			$\phi d_2$	□	ID	Dimens. ID	Rekord 1B-VA	Flutes	Enorm 1-Z/E	Flutes				
			l <sub>2</sub>	l <sub>3</sub>	□												
LK-M 3	0.5	56	11	18	3.5	2.7	2.7	.1046									
LK-M 4	0.7	63	13	21	4.5	3.4	3.55	.1048			★	3					
LK-M 5	0.8	70	15	25	6	4.9	4.4	.1050			★	3					
LK-M 6	1	80	17	30	6	4.9	5.2	.1052	★	3	★	3					
LK-M 8	1.25	90	20	35	8	6.2	7	.1054	★	3	★	3					
LK-M 10	1.5	100	22	39	10	8	8.8	.1056	★	3	★	3					

### Reduced Shank

								Tool Identification		C0203000		C0513500					
Nominal Size $\phi d_1$	P	l <sub>1</sub>	mm			$\phi d_2$	□	ID	Dimens. ID	Rekord 2B-VA	Flutes	Enorm 2-Z/E	Flutes				
			l <sub>2</sub>	l <sub>3</sub>	□												
LK-M 12	1.75	110	24	—	9	7	10.7	.1058	★	3	★	4					
LK-M 16	2	110	27	—	12	9	14.5	.1060	★	3	★	4					
LK-M 20	2.5	140	32	—	16	12	18	.1062									
LK-M 24	3	160	34	—	18	14.5	21.5	.1064									

### The alternative in locking thread technology and thread stripping prevention.

- Self-locking internal thread form
- For standard external fasteners
- Eliminates need for costly and ineffective inserts or locking parts
- Ease of assembly
- Provides uniform distribution of load over the entire thread length
- Reduces probability of thread stripping in aluminum and other soft materials



- Product Finder
- Vc
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



## Tapping Fluid

EMUGE Tapping Fluids are designed for particularly tough applications and low machine ability high tech alloys. It enables tools to cut cleanly and leave a smooth finish while allowing for accuracy and size control. Unlike other common tapping fluids EMUGE Tapping Fluid is non-toxic.

### Features and Benefits

- Reduces required torque
- Greatly improves part production
- Non-evaporative – stays on the tool
- Contains no 1.1.1. Trichloroethane

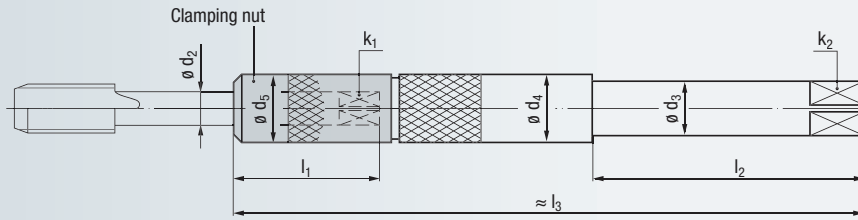
			FZ191900
4 oz.	24 units in case	.JM321	●
16 oz.	12 units in case	.JM322	●
1 gallon	6 units in case	.JM323	●
5 gallon	Plastic can with spout	.JM324	●
55 gallon	Drum	.JM325	●

For safety and disposal information please request a Material Safety Data Sheet (MSDS).





- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

For use on CNC machines and conventional thread cutting machinery



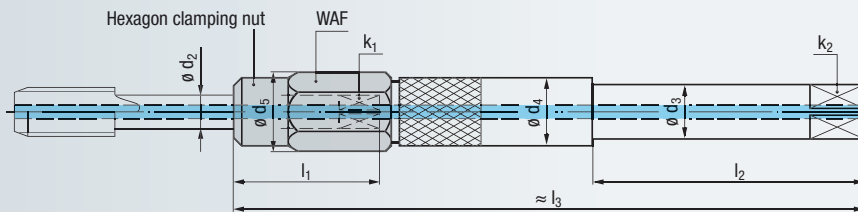
### Short Type

Tool Identification **FZ111900**

Size	Tap Dimensions				Extension Dimensions						Dimens. ID	
	$\varnothing d_2$	$k_1$			$l_1$	$\varnothing d_3$ h9	$k_2$ h12	$l_2$	$\varnothing d_4/d_5$	$l_3$		
101	0.141	0.110	No. 0 - No. 6		0.91	0.255	0.191	2.36	0.295	5.12	.101	●
102	0.168	0.131	No. 8		0.91	0.255	0.191	2.36	0.331	5.12	.102	●
103	0.194	0.152	No. 10		0.91	0.255	0.191	2.36	0.398	5.12	.103	●
104	0.220	0.165	No. 12		1.02	0.255	0.191	2.36	0.476	5.12	.104	●
105	0.255	0.191	1/4		1.02	0.255	0.191	2.36	0.476	5.12	.105	●
106	0.318	0.238	5/16		1.18	0.318	0.238	2.36	0.512	5.12	.106	●
107	0.323	0.242		7/16	1.18	0.323	0.242	3.54	0.512	7.09	.107	●
108	0.367	0.275		1/2	1.22	0.367	0.275	3.54	0.591	7.09	.108	●
109	0.381	0.286	3/8		1.30	0.381	0.286	2.36	0.591	5.12	.109	●
110	0.429	0.322		9/16	1.42	0.429	0.322	3.54	0.709	7.09	.110	●
111	0.480	0.360		5/8	1.42	0.480	0.360	3.54	0.709	7.09	.111	●
112	0.590	0.442		3/4	1.57	0.590	0.442	3.54	0.866	7.09	.112	●
113	0.697	0.523		7/8	1.69	0.697	0.523	3.94	1.024	7.87	.113	●
114	0.800	0.600		1	1.77	0.800	0.600	3.94	1.102	7.87	.114	●
115	0.896	0.672		1 1/8	1.85	0.896	0.672	3.94	1.260	7.87	.115	●
116	1.021	0.766		1 1/4	1.97	1.021	0.766	3.94	1.378	7.87	.116	●
117	1.108	0.831		1 3/8	2.13	1.108	0.831	3.94	1.496	7.87	.117	●
118	1.233	0.925		1 1/2	2.44	1.233	0.925	3.94	1.654	7.87	.118	●



Replacement clamping nuts, see page 120

For use on CNC machines and conventional thread cutting machinery



### Short Type with Coolant-Thru (IKZ)

Tool Identification **FZ112320**

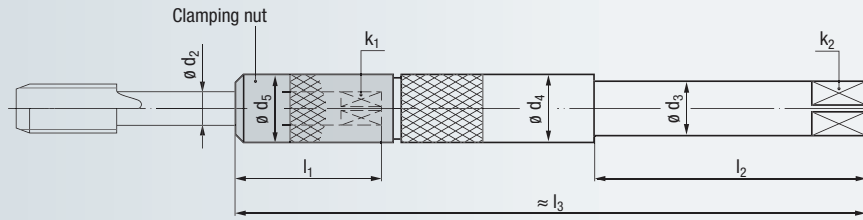
Size	Tap Dimensions				Extension Dimensions								Dimens. ID	
	$\varnothing d_2$	$k_1$			$l_1$	$\varnothing d_3$ h9	$k_2$ h12	$l_2$	$\varnothing d_4$	$\varnothing d_5$	$l_3$	WAF		
101	0.141	0.110	No. 0 - No. 6		0.91	0.255	0.191	2.36	0.295	0.354	5.12	0.315	.101	●
102	0.168	0.131	No. 8		0.91	0.255	0.191	2.36	0.331	0.394	5.12	0.354	.102	●
103	0.194	0.152	No. 10		0.91	0.255	0.191	2.36	0.398	0.531	5.12	0.472	.103	●
104	0.220	0.165	No. 12		1.02	0.255	0.191	2.36	0.476	0.531	5.12	0.472	.104	●
105	0.255	0.191	1/4		1.02	0.255	0.191	2.36	0.476	0.531	5.12	0.472	.105	●
106	0.318	0.238	5/16		1.18	0.318	0.238	2.36	0.512	0.571	5.12	0.512	.106	●
107	0.323	0.242		7/16	1.18	0.323	0.242	3.54	0.512	0.571	7.09	0.512	.107	●
108	0.367	0.275		1/2	1.22	0.367	0.275	3.54	0.591	0.650	7.09	0.591	.108	●
109	0.381	0.286	3/8		1.30	0.381	0.286	2.36	0.591	0.650	5.12	0.591	.109	●
110	0.429	0.322		9/16	1.42	0.429	0.322	3.54	0.709	0.787	7.09	0.709	.110	●
111	0.480	0.360		5/8	1.42	0.480	0.360	3.54	0.709	0.787	7.09	0.709	.111	●
112	0.590	0.442		3/4	1.57	0.590	0.442	3.54	0.866	0.984	7.09	0.866	.112	●
113	0.697	0.523		7/8	1.69	0.697	0.523	3.94	1.024	1.142	7.87	1.024	.113	●
114	0.800	0.600		1	1.77	0.800	0.600	3.94	1.102	1.260	7.87	1.102	.114	●
115	0.896	0.672		1 1/8	1.85	0.896	0.672	3.94	1.260	1.339	7.87	1.181	.115	●
116	1.021	0.766		1 1/4	1.97	1.021	0.766	3.94	1.378	1.614	7.87	1.417	.116	●

Recommended tightening torques for hexagonal clamping nuts, see page 120

Replacement hexagonal clamping nuts, see page 120



Torque wrenches, see page 427

For use on CNC machines and conventional thread cutting machinery



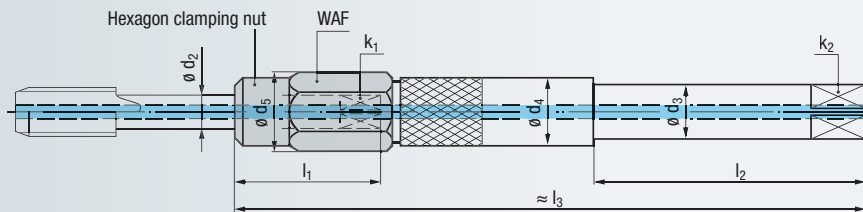
**Short Type**

Tool Identification **FZ111300**

Size	Tap Dimensions				Extension Dimensions						Dimens. ID	
	$\varnothing d_2$	$k_1$			$l_1$	$\varnothing d_3$ h9	$k_2$ h12	$l_2$	$\varnothing d_4/d_5$	$l_3$		
1	2.8	2.1	M2 - M2.6	M4	21	6	4.9	60	6.1	130	.01	●
2	3.5	2.7	M3	M4.5 - M5	22	6	4.9	60	7.5	130	.02	●
3	4	3	M3.5	M5.5	22	6	4.9	60	8.4	130	.03	●
4	4.5	3.4	M4	M6	22	6	4.9	60	8.4	130	.04	●
5	6	4.9	M4.5 - M6	M8	25	7	5.5	60	12.1	130	.05	●
6	7	5.5	M7	M9 - M10	25	7	5.5	60	12.1	130	.06	●
7	8	6.2	M8	M11	29	8	6.2	60	13	130	.07	●
8	9	7	M9	M12	30	9	7	60	15	130	.08	●
9	10	8	M10	-	32	10	8	60	15	130	.09	●
10	11	9	-	M14	35	11	9	90	18	180	.10	●
11	12	9	(M12)	M16	35	12	9	90	18	180	.11	●
12	14	11	-	M18	39	14	11	90	22	180	.12	●
13	16	12	-	M20	40	16	12	90	22	180	.13	●
14	18	14.5	-	M22 - M24	42	18	14.5	100	26	200	.14	●
15	20	16	-	M27	44	20	16	100	28	200	.15	●
16	22	18	-	M30	46	22	18	100	30	200	.16	●
17	25	20	-	M33	49	25	20	100	35	200	.17	●



Replacement clamping nuts, see page 120

For use on CNC machines and conventional thread cutting machinery



**Short Type with Coolant-Thru (IKZ)**

Tool Identification **FZ112600**

Size	Tap Dimensions				Extension Dimensions							Dimens. ID		
	$\varnothing d_2$	$k_1$			$l_1$	$\varnothing d_3$ h9	$k_2$ h12	$l_2$	$\varnothing d_4$	$\varnothing d_5$	$l_3$			WAF
1	2.8	2.1	M2 - M2.6	M4	21	6	4.9	60	6.1	6.5	130	6	.01	●
2	3.5	2.7	M3	M4.5 - M5	22	6	4.9	60	7.5	9	130	8	.02	●
3	4	3	M3.5	M5.5	22	6	4.9	60	8.4	10	130	9	.03	●
4	4.5	3.4	M4	M6	22	6	4.9	60	8.4	10	130	9	.04	●
5	6	4.9	M4.5 - M6	M8	25	7	5.5	60	12.1	13.5	130	12	.05	●
6	7	5.5	M7	M9 - M10	25	7	5.5	60	12.1	13.5	130	12	.06	●
7	8	6.2	M8	M11	29	8	6.2	60	13	14.5	130	13	.07	●
8	9	7	M9	M12	30	9	7	60	15	16.5	130	15	.08	●
9	10	8	M10	-	32	10	8	60	15	16.5	130	15	.09	●
10	11	9	-	M14	35	11	9	90	18	20	180	18	.10	●
11	12	9	(M12)	M16	35	12	9	90	18	20	180	18	.11	●
12	14	11	-	M18	39	14	11	90	22	25	180	22	.12	●
13	16	12	-	M20	40	16	12	90	22	25	180	22	.13	●
14	18	14.5	-	M22 - M24	42	18	14.5	100	26	29	200	26	.14	●
15	20	16	-	M27	44	20	16	100	28	32	200	28	.15	●
16	22	18	-	M30	46	22	18	100	30	34	200	30	.16	●
17	25	20	-	M33	49	25	20	100	35	41	200	36	.17	●

Recommended tightening torques for hexagonal clamping nuts, see page 120

Replacement hexagonal clamping nuts, see page 120

Torque wrenches, see page 427



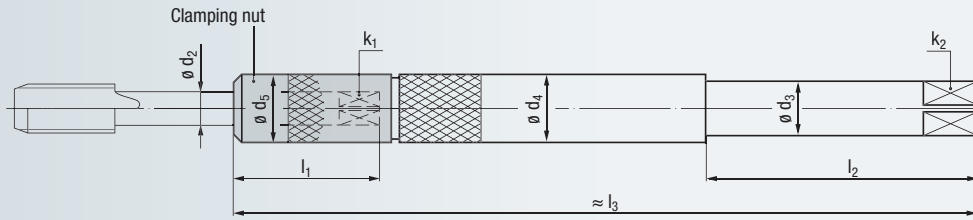
- Product Finder
- $v_c$
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



For use on CNC machines and conventional thread cutting machinery



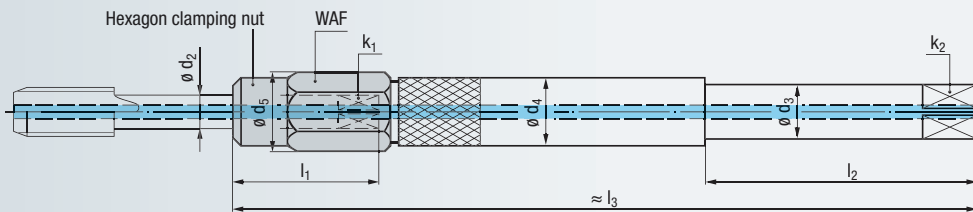
### Long Type

Tool Identification **FZ111310**

Size	Tap Dimensions				Extension Dimensions						Dimens. ID	
	ø d <sub>2</sub>	k <sub>1</sub>			l <sub>1</sub>	ø d <sub>3</sub> h9	k <sub>2</sub> h12	l <sub>2</sub>	ø d <sub>4</sub> /d <sub>5</sub>	l <sub>3</sub>		
1	2.8	2.1	M2 - M2.6	M4	21	6	4.9	70	6.1	230	.01	●
2	3.5	2.7	M3	M4.5 - M5	22	6	4.9	70	7.5	230	.02	●
3	4	3	M3.5	M5.5	22	6	4.9	70	8.4	230	.03	●
4	4.5	3.4	M4	M6	22	6	4.9	70	8.4	230	.04	●
5	6	4.9	M4.5 - M6	M8	25	7	5.5	70	12.1	230	.05	●
6	7	5.5	M7	M9 - M10	25	7	5.5	70	12.1	230	.06	●
7	8	6.2	M8	M11	29	8	6.2	80	13	230	.07	●
8	9	7	M9	M12	30	9	7	80	15	230	.08	●
9	10	8	M10	-	32	10	8	80	15	230	.09	●
10	11	9	-	M14	35	11	9	90	18	330	.10	●
11	12	9	(M12)	M16	35	12	9	90	18	330	.11	●
12	14	11	-	M18	39	14	11	90	22	330	.12	●
13	16	12	-	M20	40	16	12	90	22	330	.13	●
14	18	14.5	-	M22 - M24	42	18	14.5	100	26	330	.14	●
15	20	16	-	M27	44	20	16	100	28	330	.15	●
16	22	18	-	M30	46	22	18	100	30	330	.16	●
17	25	20	-	M33	49	25	20	100	35	330	.17	●

Replacement clamping nuts, see page 120

For use on CNC machines and conventional thread cutting machinery



### Long Type with Coolant-Thru (IKZ)

Tool Identification **FZ112610**

Size	Tap Dimensions				Extension Dimensions							Dimens. ID		
	ø d <sub>2</sub>	k <sub>1</sub>			l <sub>1</sub>	ø d <sub>3</sub> h9	k <sub>2</sub> h12	l <sub>2</sub>	ø d <sub>4</sub>	ø d <sub>5</sub>	l <sub>3</sub>			WAF
1	2.8	2.1	M2 - M2.6	M4	21	6	4.9	70	6.1	6.5	230	6	.01	●
2	3.5	2.7	M3	M4.5 - M5	22	6	4.9	70	7.5	9	230	8	.02	●
3	4	3	M3.5	M5.5	22	6	4.9	70	8.4	10	230	9	.03	●
4	4.5	3.4	M4	M6	22	6	4.9	70	8.4	10	230	9	.04	●
5	6	4.9	M4.5 - M6	M8	25	7	5.5	70	12.1	13.5	230	12	.05	●
6	7	5.5	M7	M9 - M10	25	7	5.5	70	12.1	13.5	230	12	.06	●
7	8	6.2	M8	M11	29	8	6.2	80	13	14.5	230	13	.07	●
8	9	7	M9	M12	30	9	7	80	15	16.5	230	15	.08	●
9	10	8	M10	-	32	10	8	80	15	16.5	230	15	.09	●
10	11	9	-	M14	35	11	9	90	18	20	330	18	.10	●
11	12	9	(M12)	M16	35	12	9	90	18	20	330	18	.11	●
12	14	11	-	M18	39	14	11	90	22	25	330	22	.12	●
13	16	12	-	M20	40	16	12	90	22	25	330	22	.13	●
14	18	14.5	-	M22 - M24	42	18	14.5	100	26	29	330	26	.14	●
15	20	16	-	M27	44	20	16	100	28	32	330	28	.15	●
16	22	18	-	M30	46	22	18	100	30	34	330	30	.16	●
17	25	20	-	M33	49	25	20	100	35	41	330	36	.17	●

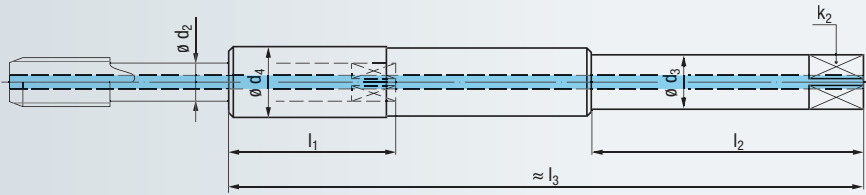
Recommended tightening torques for hexagonal clamping nuts, see page 120

Replacement hexagonal clamping nuts, see page 120

Torque wrenches, see page 427




For thermic shrinking of carbide tools with h6 shank tolerance

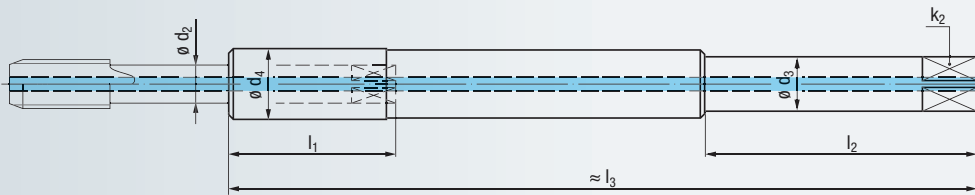


**Short Type with Coolant-Thru (IKZ)**

Tool Identification **FZ131500**


Size	Tap Dimensions		Extension Dimensions						Dimens. ID		
	$\varnothing d_2$		$l_1$	$\varnothing d_3$ h6	$k_2$ h12	$l_2$	$\varnothing d_4$	$l_3$			
5	6	M4.5 - M6	M8	31	7	5.5	60	12.1	130	.05	★
6	7	M7	M9 - M10	31	7	5.5	60	12.1	130	.06	★
7	8	M8	M11	32	8	6.2	60	13	130	.07	★
8	9	M9	M12	33	9	7	60	15	130	.08	★
9	10	M10	-	34	10	8	60	15	130	.09	★
10	11	-	M14	46	11	9	90	18	180	.10	★
11	12	(M12)	M16	46	12	9	90	18	180	.11	★
12	14	-	M18	48	14	11	90	22	180	.12	★
13	16	-	M20	49	16	12	90	22	180	.13	★

For thermic shrinking of carbide tools with h6 shank tolerance



**Long Type with Coolant-Thru (IKZ)**

Tool Identification **FZ131510**

Size	Tap Dimensions		Extension Dimensions						Dimens. ID		
	$\varnothing d_2$		$l_1$	$\varnothing d_3$ h6	$k_2$ h12	$l_2$	$\varnothing d_4$	$l_3$			
5	6	M4.5 - M6	M8	31	7	5.5	70	12.1	230	.05	★
6	7	M7	M9 - M10	31	7	5.5	70	12.1	230	.06	★
7	8	M8	M11	32	8	6.2	80	13	230	.07	★
8	9	M9	M12	33	9	7	80	15	230	.08	★
9	10	M10	-	34	10	8	80	15	230	.09	★
10	11	-	M14	46	11	9	90	18	330	.10	★
11	12	(M12)	M16	46	12	9	90	18	330	.11	★
12	14	-	M18	48	14	11	90	22	330	.12	★
13	16	-	M20	49	16	12	90	22	330	.13	★



- Product Finder
- $v_c$
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### Standard Clamping Nuts



Inch Sizes		Tool Identification		FZ112110
Size	ø d <sub>2</sub>	Dimens. ID		
101	0.141	.101	★	
102	0.168	.102	★	
103	0.194	.103	★	
104	0.220	.104	★	
105	0.255	.105	★	
106	0.318	.106	★	
107	0.323	.107	★	
108	0.367	.108	★	
109	0.381	.109	★	
110	0.429	.110	★	
111	0.480	.111	★	
112	0.590	.112	★	
113	0.697	.113	★	
114	0.800	.114	★	
115	0.896	.115	★	
116	1.021	.116	★	
117	1.108	.117	★	
118	1.233	.118	★	

Metric Sizes		Tool Identification		FZ112100
Size	ø d <sub>2</sub>	Dimens. ID		
1	2.8	.01	★	
2	3.5	.02	★	
3	4	.03	★	
4	4.5	.04	★	
5	6	.05	★	
6	7	.06	★	
7	8	.07	★	
8	9	.08	★	
9	10	.09	★	
10	11	.10	★	
11	12	.11	★	
12	14	.12	★	
13	16	.13	★	
14	18	.14	★	
15	20	.15	★	
16	22	.16	★	
17	25	.17	★	

### Hexagonal Clamping Nuts



Inch Sizes		Tool Identification		FZ112030		
Size	ø d <sub>2</sub>	WAF	Recommended tightening torque		Dimens. ID	
			ft lbs	Nm		
101	0.141	0.315	1.5	2	.101	★
102	0.168	0.354	2.1	2.8	.102	★
103	0.194	0.472	2.4	3.3	.103	★
104	0.220	0.472	2.6	3.5	.104	★
105	0.255	0.472	3.1	4.2	.105	★
106	0.318	0.512	4.4	6	.106	★
107	0.323	0.512	4.9	6.6	.107	★
108	0.367	0.591	5.9	8	.108	★
109	0.381	0.591	8.1	11	.109	★
110	0.429	0.709	11.1	15	.110	★
111	0.480	0.709	14.8	20	.111	★
112	0.590	0.866	20.7	28	.112	★
113	0.697	1.024	33.2	45	.113	★
114	0.800	1.102	44.3	60	.114	★
115	0.896	1.181	56.8	77	.115	★
116	1.021	1.417	88.5	120	.116	★

Metric Sizes		Tool Identification		FZ112000		
Size	ø d <sub>2</sub>	WAF	Recommended tightening torque		Dimens. ID	
			ft lbs	Nm		
1	2.8	6	1.5	2	.01	★
2	3.5	8	1.5	2	.02	★
3	4	9	1.8	2.5	.03	★
4	4.5	9	2.2	3	.04	★
5	6	12	2.6	3.5	.05	★
6	7	12	3.7	5	.06	★
7	8	13	4.4	6	.07	★
8	9	15	5.9	8	.08	★
9	10	15	8.1	11	.09	★
10	11	18	11.1	15	.10	★
11	12	18	14.8	20	.11	★
12	14	22	18.4	25	.12	★
13	16	22	24.3	33	.13	★
14	18	26	33.2	45	.14	★
15	20	28	44.3	60	.15	★
16	22	30	56.8	77	.16	★
17	25	30	73.8	100	.17	★

## Technical information

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Product  
FinderV<sub>c</sub>

UNC

UNF

UNEF

UN-8

M

MF

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NPSF

Rp (BSPP)

G

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

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- v<sub>c</sub>
- UNC
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## 1.1 General technical information regarding EMUGE threading tools

EMUGE threading tools are made exclusively of high-performance high-speed steels according to EMUGE specifications. Our modified tool steels are based on the material alloy group HSSE acc. DIN ISO 11054.

As for tools which are designed for a special application, these generally used tool materials do not come up to our requirements. In such cases we use special high-speed steel alloys and carbide materials which are specially selected for the work case in question. A rigorous quality control of these materials forms the basis of our high-quality tools. Research and development work is carried out in a specially equipped laboratory, and serves as an indispensable precondition for the further development of cutting geometries and other parameters necessary for thread production. Extensive tests and trials on CNC machines, conventional drilling and thread cutting machines guarantee the performance and economic efficiency of our tools.

## 1.3 Constructional designs of our EMUGE taps

## 1.2 Dimensions and technical sales conditions

The dimensional specifications of our threading tools are adjusted to the currently valid standards, with the exception of special tools made to EMUGE standards.






The DIN standards for taps are based on the General Plans of Dimensions for Taps acc. DIN 2184-1 and -2.

Please read the notes in this catalog and in the technical introduction carefully.

The technical sales conditions for taps acc. DIN 2197 and roll form taps acc. DIN 2175 have been taken into account.

The manufacturing tolerances for the thread part are in accordance with DIN EN 22857 and DIN 802.

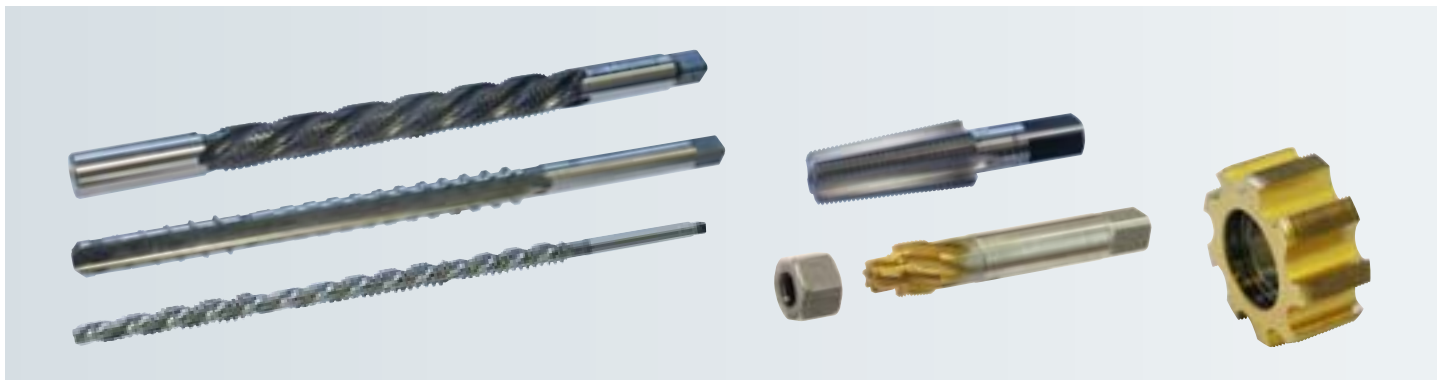
All specifications, illustrations and dimensions are subject to change due to technical progress and possible changes of the standards, and are consequently without obligation.

	Constructional design	EMUGE designation
	Hand taps, short machine taps	<b>Rekord Enorm</b>
	Machine taps with reinforced shank	<b>Rekord 1 Enorm 1</b>
	Machine taps with reduced shank	<b>Rekord 2 Enorm 2 Robust 2X</b>
	Machine taps with long flutes and long shank	<b>LF</b>
	Machine taps with extra long shank	<b>LS</b>

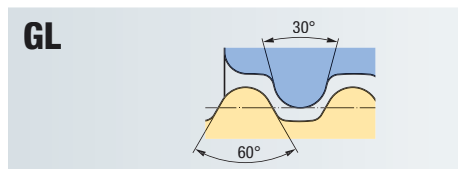
### 1.4 Special tap types (examples)

#### Special taps to customers' specifications

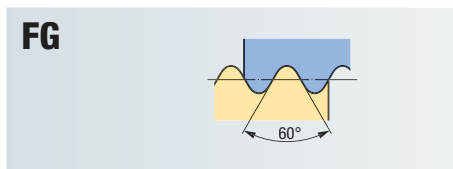
EMUGE produces special taps to customers' drawings and proper specifications.



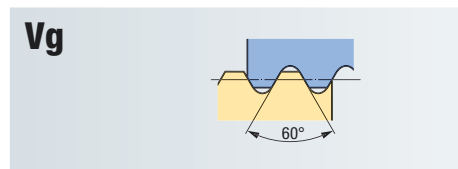
#### Special threads (examples)



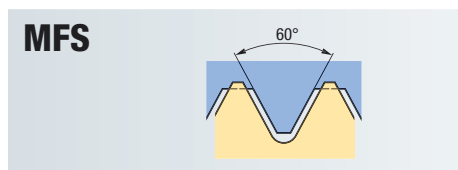
**GL**  
Cylindrical round thread  
acc. DIN 168-1



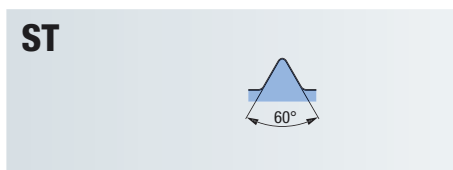
**FG**  
Bicycle thread  
acc. DIN 79012



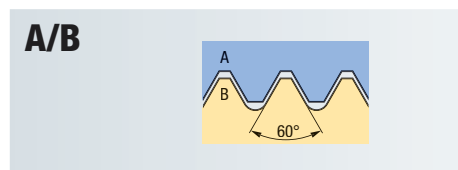
**Vg**  
Valve thread  
acc. DIN 7756



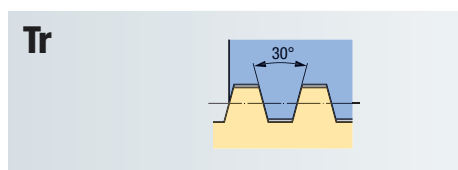
**MFS**  
ISO Metric thread for tight fit  
acc. DIN 8141-1



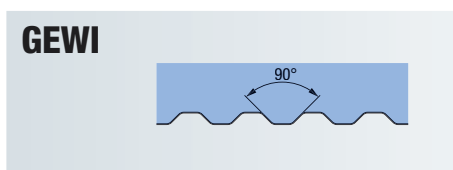
**ST**  
Sheet metal screw thread  
acc. DIN EN ISO 1478



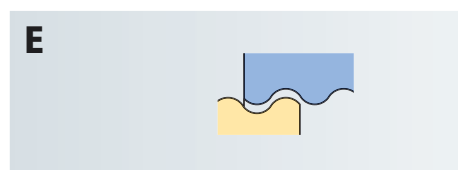
**A/B**  
Tripod connection thread  
acc. DIN 4503



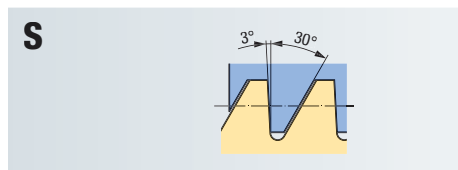
**Tr**  
Flat ISO metric trapezoidal thread  
(one-start and multi-start) acc. DIN 380-1 and -2



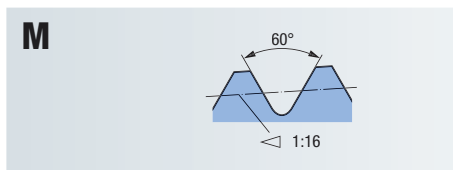
**GEWI**  
Special profile



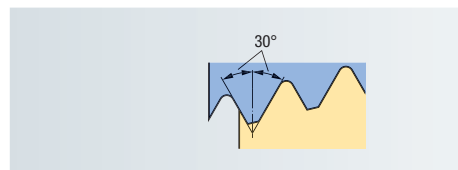
**E**  
Electrical thread  
acc. DIN 40400



**S**  
Metric buttress thread (one-start and multi-start)  
acc. DIN 513-1 to -3



**M**  
Metric tapered external thread acc. DIN 158-1



Thread for wire release connection  
acc. DIN 19004

Product  
Finder

V<sub>c</sub>

UNC

UNF

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UN-8

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MF

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NPSF

Rp (BSPP)

G

NPT

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Rc (BSPT)

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- Rc (BSPT)
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- Accessories
- Tech. Info

### 1.5 Basic types of our EMUGE taps

#### Rekord A



- Straight flutes
- Chamfer form C (2-3 threads)
- Chamfer form E (1.5-2 threads)
- For blind hole and through hole threads

**Note:**  
Especially for short-chipping material. The flutes can hold only a part of the chips. There is practically no chip transport in an axial direction. We do not recommend using this tap type in deep blind hole or through hole threads in long-chipping material.

#### Rekord B



- Straight flutes with spiral point
- Chamfer form B (4-5 threads)
- For through hole threads

**Note:**  
Typical tool for through hole threads in long-chipping material. The spiral point pushes the tightly rolled chips ahead and prevents clogging of the flutes. Coolant-lubricant can flow freely. Do not use this tap type for a reverse cut!

#### Rekord C



- 8-15° left-hand spiral flutes
- Chamfer form D (4-5 threads)
- For through hole threads

**Note:**  
The left-hand spiral flutes push the chips ahead. As opposed to the spiral-point design (Rekord B), the rake angle remains constant over the complete length of the chamfer. This means extremely stable chamfer teeth for high-strength materials.

#### Rekord D



- 10-15° right-hand spiral flutes
- Chamfer form E (1.5-2 threads)
- Chamfer form C (2-3 threads)
- For blind hole threads

**Note:**  
Especially to be recommended on automatic lathes and multi-spindle machines. The slow spiral flutes will be especially helpful in thread holes beginning with an increased diameter (counterbore or enlarged bore). Provided with internal coolant supply, this tap type will help to solve chip problems on CNC machines.

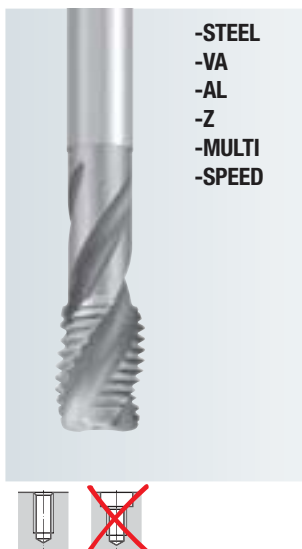
#### Rekord DF



- 10-15° right-hand spiral flutes
- Additional helix correction "F" (relief)
- Chamfer form C (2-3 threads)
- For blind hole threads

**Note:**  
Especially to be recommended on automatic lathes and multi-spindle machines. The slow spiral flutes will be especially helpful in thread holes beginning with an increased diameter (counterbore or enlarged bore). The additional helix correction "F" (relief) produces smaller, and tightly rolled chips. Provided with internal coolant supply, this tap type will help to solve chip problems on CNC machines.

#### Enorm

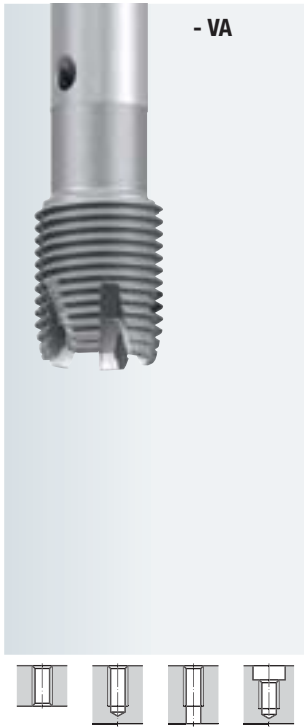


- 35-50° right-hand spiral flutes
- Chamfer form E (1.5-2 threads)
- Chamfer form C (2-3 threads)
- For blind hole threads in long-chipping materials

**Note:**  
Typical tool for blind hole threads in long-chipping materials. The fast spiral flutes provide good chip removal from the blind hole. Depending on design and size, threads up to 3 x d<sub>1</sub> can be cut. Not to be recommended for threads beginning with an increased diameter.

## 1.5 Basic types of our EMUGE taps

### Robust 2X



- Provided with a hollow face
- Chamfer form C (2-3 threads)
- For blind hole and through hole threads

**Note:**

The special crown-shaped front portion of this tool provides excellent accuracy even in the first stage of the cutting process. Extra clean and accurate threads can be cut in this way. The swarf is collected in the hollow face of the tap (internal chip collector) when cutting blind hole threads. For this tool, we recommend using paste lubrication wherever possible. Please make sure to cover not only the tool but also the walls of the hole with paste! Oil lubrication is possible only in vertical machining, if the blind hole can be completely filled with oil.

Product Finder

V<sub>c</sub>

UNC

UNF

UNEF

UN-8

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MF

NPSM/NPSC

NPSP

Rp (BSPP)

G

NPT

NPTF

Rc (BSPT)

STI

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## 1.6 Our EMUGE geometries

### STEEL

**For steel materials**

Especially for short-chipping material. The flutes can hold only a part of the chips. There is practically no chip transport in an axial direction. We do not recommend using this tap type in deep blind hole or through hole threads in long-chipping material.

### VA

**For stainless steel materials and steel materials**

With tough and long-chipping materials, the chips must be transported in an axial direction in order to avoid chip jams. An increased profile relief angle reduces friction and with it, the danger of cold welding.



### GJV

**For cast iron with vermicular graphite**

Newly developed cast materials often show very special grain structures. In combination with an increased number of flutes and a specially adjusted geometry, these tools permit long tool life even in these highly abrasive materials as well as in normal cast iron.

### AL

**For aluminum wrought alloys**

In the machining of long-chipping aluminum, it is absolutely necessary to provide chip transport in an axial direction. In addition to the large rake angle, these tools are made with a reduced number of flutes so that there is even more room for the swarf. This helps to avoid clogging of the flutes.

### GAL

**For aluminum cast alloys**

In order to achieve a long tool life in this highly abrasive material, all the tools are provided with a hard surface coating. Internal coolant supply also is very helpful.

### MS

**For copper-zinc alloys (brass, short-chipping)**

A small rake angle ensures that true-to-gauge threads are produced. Straight flutes are perfectly suited for short-chipping brass.

## 1.6 Our EMUGE geometries

### MG

#### For magnesium alloys

This workpiece material is gaining more and more importance, especially in the automotive industry. The special geometry, in combination with an anti-friction layer, makes it possible to use this tool for dry machining as well as for oil and emulsion lubrication.

### PVC

#### For long-chipping synthetics

The chamfer of this tool has been optimized in order to ensure a safe shearing off of the chip root in the thread. An elevated tolerance, combined with a hard surface coating, guarantees true-to-gauge threads in these elastic materials.

### TILEG

#### For titanium alloys

Titanium alloys are becoming more and more popular in modern industry. The geometry of this tool has been specially adjusted to the machining of these materials. Cold welding is prevented by the extra high relief angle values. A helix correction provides short chips.

### H

#### For materials of high tensile strength

Relatively high relief angle values in combination with a surface treatment or a hard surface coating ensure extra long tool life in abrasive materials.

### Z

#### For CNC-controlled machines

This very keen cutting geometry with elevated rake and relief angles is suitable for a multitude of long-chipping materials. It is designed especially for CNC-controlled machine tools. Synchronous feed control, especially in connection with our collet holders of the Softsynchro® series, will bring out the full performance potential of these tools.

### MULTI

#### For almost all materials

One tool design for a large number of workpiece materials. Stocking costs can be considerably reduced in this way.

### FK

#### For short-chipping synthetics

Large relief angles in combination with carbide material will help to achieve long tool life in abrasive materials (duroplastics, fiber-reinforced synthetics). For workpiece materials with a fiber content of less than 30%, an HSSE tool is available as an alternative.

### TI

#### For titanium

These alloys are usually very strong, long-chipping and clamping. Small rake angles and very high relief angles are necessary. Often, it is necessary also to specially adjust the tool to the individual alloy and the specific work conditions.

### NI

#### For nickel alloys

Nickel alloys are usually very tough, clamping and of high tensile strength, e.g. Inconel 718. Negative rake angles, very high relief angles and a hard surface coating are an unconditional necessity. Lubrication with paste or oil is necessary in most cases.

### HCUT

#### For hardened steels

This geometry with its specially adjusted flute profiles and its special rake and relief angles makes thread cutting in hardened steel possible. Made of cutting material HSSE-PM, these tools are suitable for a material hardness of 44-55 HRC, while solid carbide tools will work in a hardness of 55-63 HRC.

### AERO

#### For tough materials with high tensile strength

Negative rake angle values gives a very strong cutting edge. Especially in tough materials with high tensile strength this will lead to a safe tapping process.

### SPEED

#### For high-speed tapping

CNC machines, especially in combination with tapping attachments, make very high speeds possible. The special geometry of these tools, combined with a hard surface coating, offers you the chance to do your machining at the highest speeds your machine can manage.





## 1.7 Our EMUGE surface treatments and coatings

## NE2

**Oxidation**

In a special installation, the tools are exposed to hot steam. This leads to the formation of a dark oxide layer on the tool surface. This oxide layer protects the surface, and acts as a good carrier of lubricants. Cold welding which occurs especially with low-carbon, soft steels, can be prevented in this way.

## NT

**Nitriding**

In a thermo-chemical treatment, the surface is enriched with nitrogen to a depth of approx. 0.03 to 0.05 mm. Since the surface becomes very hard (1000-1250 HV) and brittle, nitrided tools can be used with certain restrictions only in blind holes and in all work cases which necessitate reversing. In abrasive materials like cast iron, spheroidal cast iron, cast aluminum and duroplastics, tool life can be increased in a decisive manner.

## NT2

**Nitriding and oxidation**

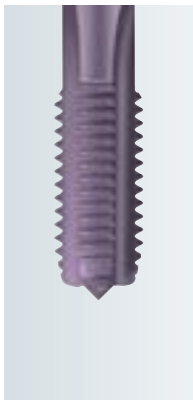
The surface of the tools is first nitrided and then oxidised (NT + NE2). This treatment combines increased surface hardness with an improved lubricant-holding capacity.

## TIN, TIN-T1

**Titanium-nitride (gold-yellow)**

In a PVD process (500 °C) a coating thickness of 1-4 µm can be realized. The hardness of approx. 2300 HV, the good sliding properties and coating adhesion guarantee long tool life. The special structure of the multi-layer coating TIN-T1 helps to achieve considerable tool life increases.

## TICN

**Titanium carbonitride (blue-grey)**

In a PVD process (500 °C) a coating thickness of 2-4 µm can be realized. The hardness is approx. 3000 HV. The TICN coating will resist up to approx. 400 °C.

## GLT-1

**Hard surface coating with anti-friction layer (dark-grey)**

In a PVD process (500 °C) a coating thickness of 2-4 µm can be realized. The combination of a hard surface coating (approx. 3000 HV) with a superimposed anti-friction layer yields decisive tool life advantages. Also, the chip flow can be very positively influenced.

**Please note:**

Before re-coating, tools need to be de-coated!

## GLT-8

**Diamond-like, amorphous carbon coating (black-grey)**

In a PVD process a coating thickness of 1-2 µm can be realized. The hardness is approx. 2500 HV. This mono-layer coating is an excellent choice for the machining of non-ferrous metals and aluminum with a low silicon content (< 9% Si). Thanks to the low friction, material adhesion is drastically reduced. This coating will remain resistant up to approx. 350 °C.

## CRN

**Chromium nitride (silver-grey)**

In a PVD process (500 °C) coating thicknesses of up to 6 µm can be realized. With a hardness of 1750 HV, the excellent sliding properties will help to achieve long tool life in non-ferrous metals and thermoplastics (even at high temperatures).

Product  
FinderV<sub>c</sub>

UNC

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MF

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## 1.8 Other EMUGE abbreviations

### AZ



**With alternating teeth**

With “alternating teeth”, flank friction can be reduced. Coolant-lubricant can flow freely between the friction partners.

### X



**With back taper**

Tooth chipping due to chip jams can be prevented by grinding off the tooth crests in the guide thread area.

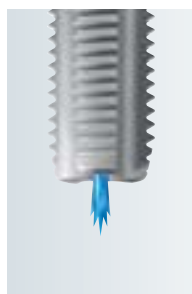
### BF



**With bright face**

“Bright Face” grinding in combination with a special edge preparation ensures that chips will break. Short chips will be evacuated without “birdnesting”.

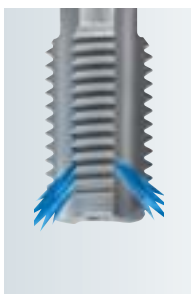
### IKZ



**Internal coolant-lubricant supply, axial (DIN designation: KA)**

The axial exit of coolant-lubricant provides optimum cooling and lubrication in the chamfer area. Chips are evacuated easily from blind holes.

### IKZN



**Internal coolant-lubricant supply, axial, with coolant exiting in the flutes (DIN designation: KR)**

Radial exit of coolant-lubricant is the safest solution for providing coolant-lubricant supply in the chamfer area even in through holes.

### LF

**Machine tap with long flutes and long shank**

Depending on the workpiece material, thread depths of up to  $4 \times d_1$  can be achieved with the extended thread part and the long flutes



### LS

**Machine taps with extra long shank**

Threads with bad access can be easily machined with these tools.



### LH

**Left-hand thread**

Left-hand taps are mirror-image designs of the right-hand taps.

### OKO

**Machine taps for dry machining and minimum-quantity lubrication (MQL)**

Depending on the design, tools are optimized for dry machining or for minimum-quantity lubrication.

### VHM

**Solid carbide**

Tools with a thread diameter  $< 12.5$  mm are made of solid carbide (thread part and shank).

### KHM

**Solid carbide head**

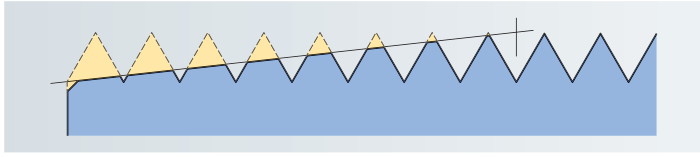
With tools with a thread diameter  $\geq 12.5$  mm, the head, or thread part, is made of solid carbide, the shank of tool steel.

## 1.9 Chamfer forms

Chamfer forms and chamfer lengths for taps acc. DIN 2197.

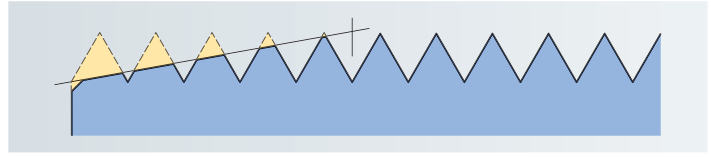
### Form A

Chamfer length 6-8 threads for straight flutes



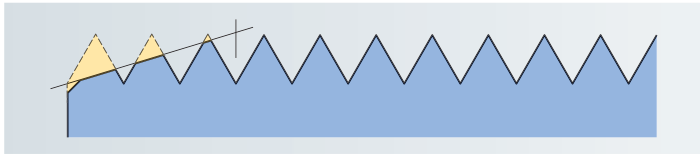
### Form B

Chamfer length 3.5-5.5 threads for straight flutes with spiral point



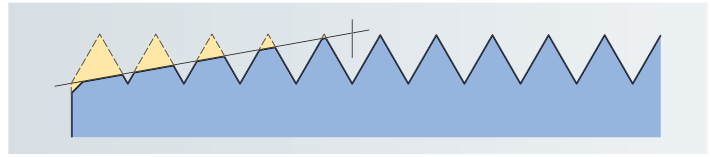
### Form C

Chamfer length 2-3 threads for straight or spiral flutes



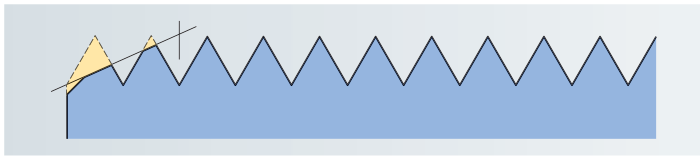
### Form D

Chamfer length 3.5-5 threads for straight or spiral flutes



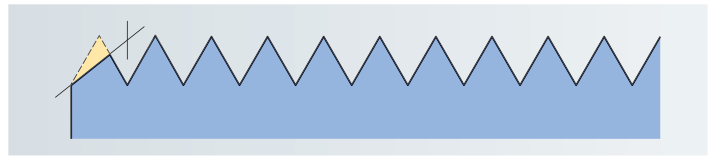
### Form E

Chamfer length 1.5-2 threads for straight or spiral flutes



### Form F

Chamfer length 1-1.5 threads for straight or spiral flutes



The chamfer length of our EMUGE taps is adjusted to the workpiece material in each individual case.

## 1.10 Cooling and lubrication agents

Lubricants are often, if not generally, given too little consideration. If you want to get the best performance out of your tool you have to take care to use the best coolant-lubricant available. In general, we distinguish the following types of cooling and lubrication:

### A

#### Dry machining, pressurized air, cold pressurized air

"Real" dry machining is mostly used only in cast iron. Pressurized air, sometimes cooled, is used in some cases for chip removal.

### E

#### Emulsion

The most common type of coolant-lubricant on machining centres.

### O

#### Thread cutting oil

With these oils which are perfectly adjusted to specific materials, excellent thread surfaces and tool life can be achieved.



### M

#### Minimum-quantity lubrication (MQL)

Due to the more and more common option of supplying aerosol through the spindle on modern machining centres, this type of cooling and lubrication is gaining more and more popularity.

### P

#### Thread cutting paste

Perfectly suitable for the cold forming of threads. Especially useful in horizontal machining, with large thread sizes and through hole threads. To be used only for brush lubrication.



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- R<sub>p</sub> (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

## 1.11 Tolerance chart – UNC/UNF

EMUGE has determined that the tolerance of the tap should be manufactured as close as possible to the finished internal thread tolerance.

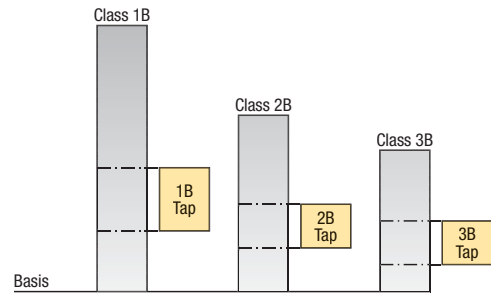
This practice ensures that the threads produced will comply to the gage tolerances providing that the working conditions such as machine, chucking tools, and workpiece match the application.

EMUGE taps are marked with the appropriate tolerance class for their intended use. The U.S. GH thread class numbers are not marked on the tap.

Tolerances for the various GH numbers are shown in the chart opposite.

Classification for the tolerance 1B can be provided upon request.

Taps for cast iron and titanium tapping are designed one GH class higher to provide better tool life.



UNC Thread	Tap Limit	
	3B (Tap)	2B (Tap)
No. 1 - 64	H1 / H2	H2 / H3
No. 2 - 56	H1 / H2	H2 / H3
No. 3 - 48	H1 / H2	H2 / H3
No. 4 - 40	H2	H2 / H3
No. 5 - 40	H2	H2 / H3
No. 6 - 32	H2	H3 / H4
No. 8 - 32	H2	H3 / H4
No. 10 - 24	H2 / H3	H3 / H4
No. 12 - 24	H2 / H3	H3 / H4
1/4 - 20	H3	H4 / H5
5/16 - 18	H3	H4 / H5
3/8 - 16	H3 / H4	H4 / H5
7/16 - 14	H3 / H4	H4 / H5
1/2 - 13	H4	H5 / H6
9/16 - 12	H4	H5 / H6
5/8 - 11	H4	H5 / H6
3/4 - 10	H4 / H5	H6 / H7
7/8 - 9	H4 / H5	H6 / H7
1 - 8	H5	H6 / H7
1 1/8 - 7	H5	H7 / H8
1 1/4 - 7	H5 / H6	H7 / H8
1 3/8 - 6	H6	H7 / H8
1 1/2 - 6	H6	H7 / H8
1 3/4 - 5	H6 / H7	H8 / H9
2 - 4 1/2	H7	H8 / H9

UNF Thread	Tap Limit	
	3B (Tap)	2B (Tap)
No. 0 - 80	H1	H1 / H2
No. 1 - 72	H1 / H2	H2 / H3
No. 2 - 64	H1 / H2	H2 / H3
No. 3 - 56	H1 / H2	H2 / H3
No. 4 - 48	H2	H2 / H3
No. 5 - 44	H2	H2 / H3
No. 6 - 40	H2	H2 / H3
No. 8 - 36	H2	H2 / H3
No. 10 - 32	H2	H2 / H3
No. 12 - 28	H2 / H3	H3 / H4
1/4 - 28	H2 / H3	H3 / H4
5/16 - 24	H3	H3 / H4
3/8 - 24	H3	H3 / H4
7/16 - 20	H3	H4 / H5
1/2 - 20	H3	H4 / H5
9/16 - 18	H3 / H4	H4 / H5
5/8 - 18	H3 / H4	H5 / H6
3/4 - 16	H4	H5 / H6
7/8 - 14	H4	H5 / H6
1 - 12	H4 / H5	H5 / H6
1 1/8 - 12	H4 / H5	H6 / H7
1 1/4 - 12	H4 / H5	H6 / H7
1 3/8 - 12	H4 / H5	H6 / H7
1 1/2 - 12	H4 / H5	H6 / H7

### 1.12 Tolerance chart – Metric coarse/fine

The approved tap tolerance system for metric ISO threads is International Standard ISO 2857.

- 4H tap corresponds to ISO 1
- 6H tap corresponds to ISO 2
- 6G tap corresponds to ISO 3

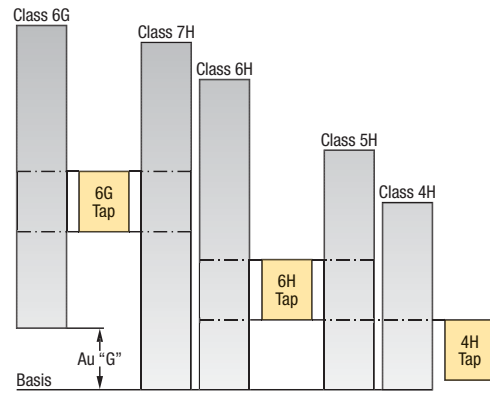
4H and 6G taps can be supplied upon request. 6G taps are Oversize.

Please refer to the Au “G” values table below.

The U.S. GD tap class numbers are not marked on our taps.

Taps for cast iron and titanium tapping are designed one GH class higher to provide better tool life.

For the special tolerance “7G”, an oversize of approx. 2 x Au “G” has been taken into account.



Metric Coarse Thread	Pitch	Tap Tolerance	
		4H	6H
M 1.6	0.35	D2	D2 / D3
M 1.8	0.35	D2	D2 / D3
M 2	0.4	D2	D3
M 2.2	0.45	D2	D3
M 2.5	0.45	D2	D3
M 3	0.5	D2	D3
M 3.5	0.6	D2	D3 / D4
M 4	0.7	D2 / D3	D3 / D4
M 4.5	0.75	D2 / D3	D3 / D4
M 5	0.8	D2 / D3	D3 / D4
M 6	1	D2 / D3	D4 / D5
M 7	1	D2 / D3	D4 / D5
M 8	1.25	D3	D4 / D5
M 10	1.5	D3	D4 / D5
M 12	1.75	D3 / D4	D5 / D6
M 14	2	D3 / D4	D5 / D6
M 16	2	D3 / D4	D5 / D6
M 18	2.5	D4	D6 / D7
M 20	2.5	D4	D6 / D7
M 22	2.5	D4	D6 / D7
M 24	3	D4 / D5	D7 / D8
M 27	3	D4 / D5	D7 / D8
M 30	3.5	D4 / D5	D7 / D8
M 33	3.5	D4 / D5	D8 / D9
M 36	4	D5	D8 / D9
M 39	4	D5	D8 / D9
M 42	4.5	D5	D8 / D9
M 45	4.5	D5	D8 / D9
M 48	5	D5 / D6	D9 / D10
M 52	5	D5 / D6	D9 / D10

Metric Fine Thread (choice)	Tap Tolerance	
	4H	6H
M 3 x 0.35	D2	D3
M 4 x 0.5	D2	D3
M 6 x 0.5	D2 / D3	D3 / D4
M 6 x 0.75	D2 / D3	D4
M 8 x 0.75	D2 / D3	D4
M 8 x 1	D3	D4 / D5
M 12 x 1	D3	D4 / D5
M 10 x 1.25	D3	D4 / D5
M 14 x 1.25	D3	D4 / D5
M 12 x 1.5	D3 / D4	D5 / D6
M 20 x 1.5	D3 / D4	D5 / D6
M 24 x 1.5	D3 / D4	D5 / D6
M 42 x 1.5	D3 / D4	D5 / D6
M 18 x 2	D3 / D4	D6 / D7
M 24 x 2	D4	D6 / D7
M 42 x 2	D4	D6 / D7
M 36 x 3	D4 / D5	D7 / D8
M 42 x 3	D4 / D5	D7 / D8
M 52 x 3	D4 / D5	D7 / D8

### 1.13 Tolerance chart – Oversize 6G taps

Au “G” Values for Oversize Taps “6G Taps”

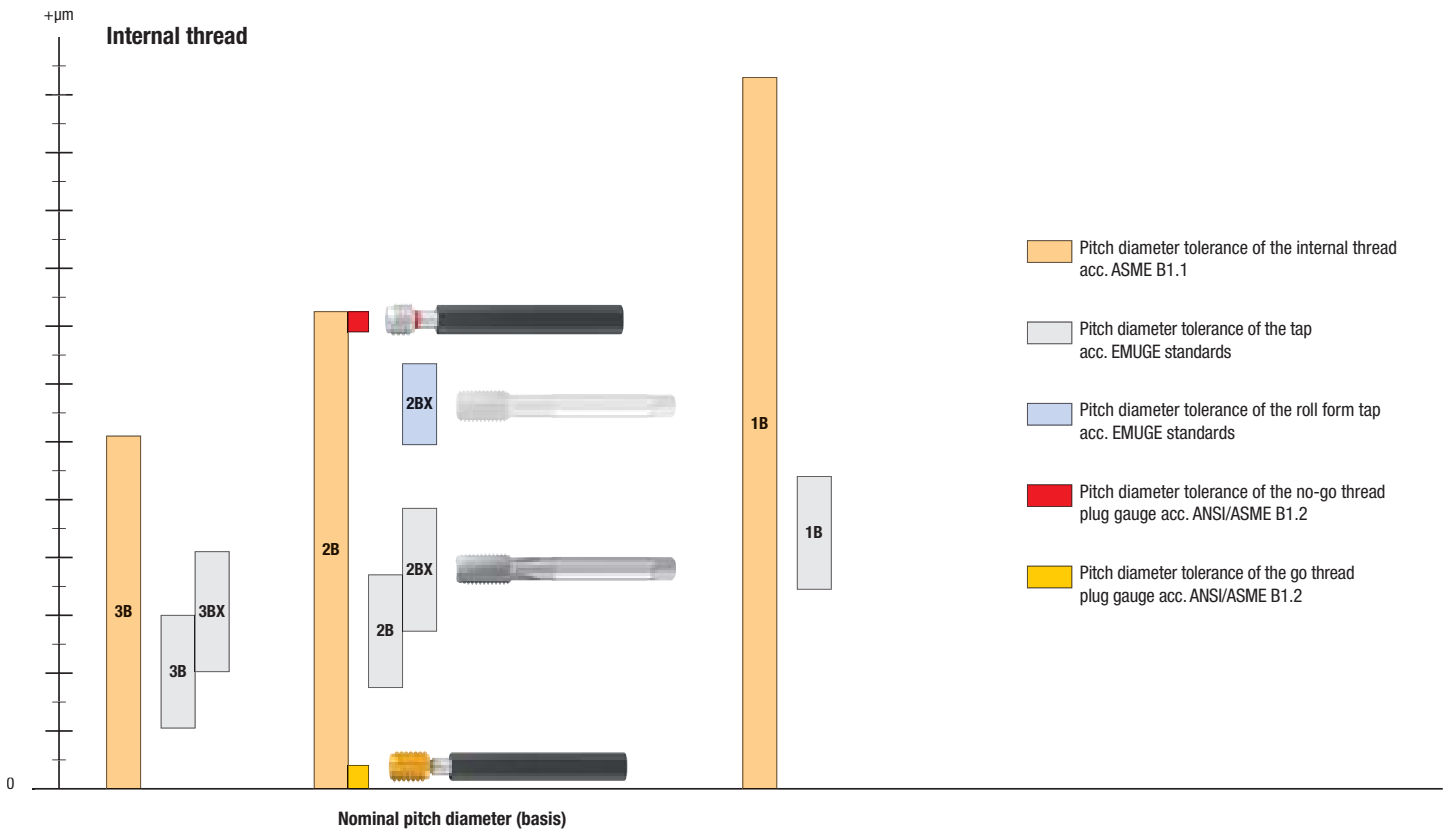
Pitch	Tap Tolerance	
	mm	inch
0.35 - 0.4	0.019	.00075
0.45 - 0.5	0.020	.00079
0.6	0.021	.00083
0.7 - 0.75	0.022	.00087
0.8	0.024	.00094
1	0.026	.0010
1.25	0.028	.0011
1.5	0.032	.0013
1.75	0.034	.0013
2	0.038	.0015
2.5	0.042	.0017
3	0.048	.0019
3.5	0.053	.0021
4	0.060	.0024
4.5	0.063	.0025
5	0.071	.0028

- Product Finder
- Vc
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
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- G
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

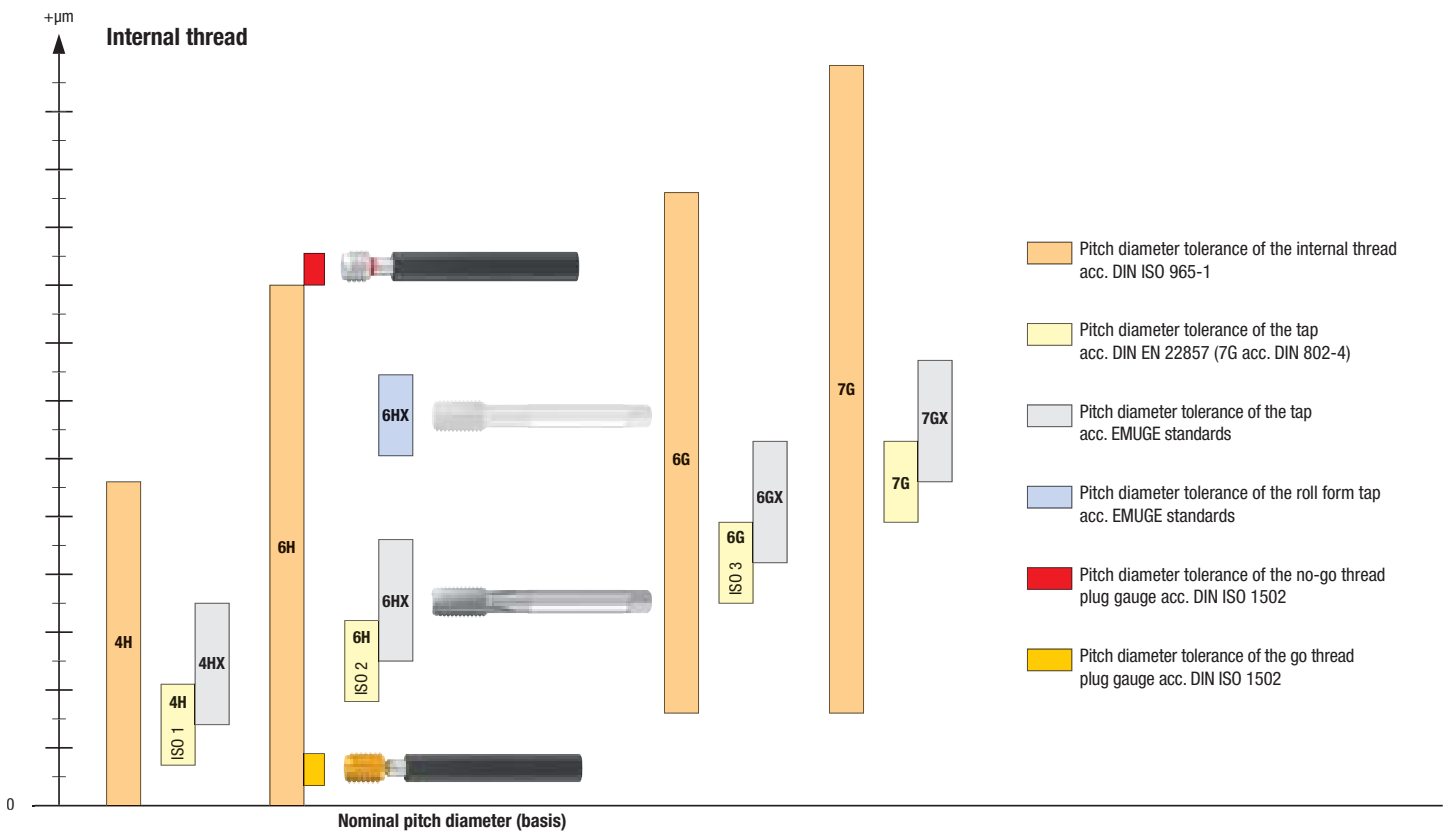


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
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## 1.14 Tolerance zones of the pitch diameter on the Unified thread (graphic representation)



## 1.15 Tolerance zones of the pitch diameter on the Metric thread (graphic representation)



### 1.16 Recommended Tap Drill Sizes for Tapping Internal Threads

#### UNC

Unified coarse thread ASME B1.1, Table 2

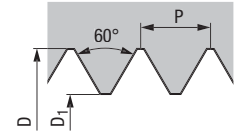
Nominal Size D	P [T.P.I.]	Minor thread dia. of the internal thread (Tol. 2B)		Rec. tap drill size
		D <sub>1</sub> min.	D <sub>1</sub> max.	
No. 1 (0.073)	64	0.0561	0.0622	0.0595
No. 2 (0.086)	56	0.0667	0.0737	0.0700
No. 3 (0.099)	48	0.0764	0.0845	0.0820
No. 4 (0.112)	40	0.0849	0.0939	0.0890
No. 5 (0.125)	40	0.0979	0.1062	0.1015
No. 6 (0.138)	32	0.1040	0.1140	0.1110
No. 8 (0.164)	32	0.1300	0.1390	0.1360
No. 10 (0.190)	24	0.1450	0.1550	0.1520
No. 12 (0.216)	24	0.1710	0.1810	0.1770
1/4	20	0.1960	0.2070	0.2040
5/16	18	0.2520	0.2650	0.2610
3/8	16	0.3070	0.3210	0.3160
7/16	14	0.3600	0.3760	0.3680
1/2	13	0.4170	0.4340	0.4219
9/16	12	0.4720	0.4900	0.4844
5/8	11	0.5270	0.5460	0.5313
3/4	10	0.6420	0.6630	0.6563
7/8	9	0.7550	0.7780	0.7656
1	8	0.8650	0.8900	0.8750
1 1/8	7	0.9700	0.9980	0.9843
1 1/4	7	1.0950	1.1230	1.1094
1 3/8	6	1.1950	1.2250	1.2205
1 1/2	6	1.3200	1.3500	1.3386
1 3/4	5	1.5330	1.5670	1.5551
2	4 1/2	1.7590	1.7950	1.7812
2 1/4	4 1/2	2.0090	2.0450	2.0312
2 1/2	4	2.2290	2.2670	2.2500
2 3/4	4	2.4790	2.5170	2.5000
3	4	2.7290	2.7670	2.7500

#### UNF

Unified fine thread ASME B1.1, Table 2

Nominal Size D	P [T.P.I.]	Minor thread dia. of the internal thread (Tol. 2B)		Rec. tap drill size
		D <sub>1</sub> min.	D <sub>1</sub> max.	
No. 0 (0.060)	80	0.0465	0.0514	0.0480
No. 1 (0.073)	72	0.0580	0.0634	0.0595
No. 2 (0.086)	64	0.0691	0.0752	0.0730
No. 3 (0.099)	56	0.0797	0.0865	0.0827
No. 4 (0.112)	48	0.0894	0.0968	0.0945
No. 5 (0.125)	44	0.1004	0.1079	0.1063
No. 6 (0.138)	40	0.1110	0.1190	0.1181
No. 8 (0.164)	36	0.1340	0.1420	0.1378
No. 10 (0.190)	32	0.1560	0.1640	0.1614
No. 12 (0.216)	28	0.1770	0.1860	0.1820
1/4	28	0.2110	0.2200	0.2165
5/16	24	0.2670	0.2770	0.2717
3/8	24	0.3300	0.3400	0.3346
7/16	20	0.3830	0.3950	0.3898
1/2	20	0.4460	0.4570	0.4528
9/16	18	0.5020	0.5150	0.5118
5/8	18	0.5650	0.5780	0.5709
3/4	16	0.6820	0.6960	0.6890
7/8	14	0.7980	0.8130	0.8071
1	12	0.9100	0.9280	0.9219
1 1/8	12	1.0350	1.0530	1.0433
1 1/4	12	1.1600	1.1780	1.1719
1 3/8	12	1.2850	1.3030	1.2992
1 1/2	12	1.4100	1.4280	1.4173

#### American Standard Threads



#### UNEF

Unified extra fine thread ASME B1.1, Table 2

Nominal Size D	P [T.P.I.]	Minor thread dia. of the internal thread (Tol. 2B)		Rec. tap drill size
		D <sub>1</sub> min.	D <sub>1</sub> max.	
No. 12 (0.216)	32	0.1820	0.1900	0.1875
1/4	32	0.2160	0.2240	0.2205
5/16	32	0.2790	0.2860	0.2835
3/8	32	0.3410	0.3490	0.3465
7/16	28	0.3990	0.4070	0.4040
1/2	28	0.4610	0.4700	0.4646
9/16	24	0.5170	0.5270	0.5236
5/8	24	0.5800	0.5900	0.5807
3/4	20	0.6960	0.7070	0.6988
7/8	20	0.8210	0.8320	0.8268
1	20	0.9460	0.9570	0.9531
1 1/8	18	1.0650	1.0780	1.0728
1 1/4	18	1.1900	1.2030	1.2008
1 3/8	18	1.3150	1.3280	1.3189
1 1/2	18	1.4400	1.4530	1.4488

#### UN-8

Unified thread ASME B1.1, Table 2

Nominal Size D	P [T.P.I.]	Minor thread dia. of the internal thread (Tol. 2B)		Rec. tap drill size
		D <sub>1</sub> min.	D <sub>1</sub> max.	
1 1/8	8	0.9900	1.0150	1.0000
1 1/4	8	1.1150	1.1400	1.1250
1 3/8	8	1.2400	1.2650	1.2500
1 1/2	8	1.3650	1.3900	1.3750
1 5/8	8	1.4900	1.5150	1.5000
1 3/4	8	1.6150	1.6400	1.6250
1 7/8	8	1.7400	1.7650	1.7500
2	8	1.8650	1.8900	1.8750
2 1/4	8	2.1150	2.1400	2.1250
2 1/2	8	2.3650	2.3900	2.3750
2 3/4	8	2.6150	2.6400	2.6250
3	8	2.8650	2.8900	2.8750
3 1/2	8	3.3650	3.3900	3.3750
4	8	3.8650	3.8900	3.8750
4 1/2	8	4.3650	4.3900	4.3750

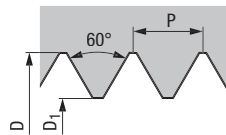
- Product Finder
- Vc
- UNC
- UNF
- UNEF
- UN-8
- MF
- NPSM/NPSC
- NPSF
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- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
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- NPTF
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- Accessories
- Tech. Info**

### 1.16 Recommended tap drill sizes for tapping internal threads

## ISO Metric Threads



## M

ISO Metric coarse thread DIN 13 and DIN ISO 965-1, ASME B1.13M

Nominal Size	Minor thread dia. of the internal thread (Tol. 6H)		Rec. tap drill size		
	D	P [mm]	D <sub>1</sub> min. [mm]	D <sub>1</sub> max. [mm]	[mm]
M 2	0.4	1.567	1.679	1.6	0.0630
M 2.5	0.45	2.013	2.138	2.05	0.0807
M 3	0.5	2.459	2.599	2.5	0.0984
M 3.5	0.6	2.850	3.010	2.9	0.1142
M 4	0.7	3.242	3.422	3.3	0.1299
M 4.5	0.75	3.688	3.878	3.7	0.1457
M 5	0.8	4.134	4.334	4.2	0.1654
M 6	1	4.917	5.153	5	0.1969
M 7	1	5.917	6.153	6	0.2362
M 8	1.25	6.647	6.912	6.8	0.2677
M 9	1.25	7.647	7.912	7.8	0.3071
M 10	1.5	8.376	8.676	8.5	0.3346
M 11	1.5	9.376	9.676	9.5	0.3740
M 12	1.75	10.106	10.441	10.2	0.4016
M 14	2	11.835	12.210	12	0.4724
M 16	2	13.835	14.210	14	0.5512
M 18	2.5	15.294	15.744	15.5	0.6102
M 20	2.5	17.294	17.744	17.5	0.6890
M 22	2.5	19.294	19.744	19.5	0.7677
M 24	3	20.752	21.252	21	0.8268
M 27	3	23.752	24.252	24	0.9449
M 30	3.5	26.211	26.771	26.5	1.0433
M 33	3.5	29.211	29.771	29.5	1.1614
M 36	4	31.670	32.270	32	1.2598
M 39	4	34.670	35.270	35	1.3780
M 42	4.5	37.129	37.799	37.5	1.4764
M 45	4.5	40.129	40.799	40.5	1.5945
M 48	5	42.587	43.297	43	1.6929
M 52	5	46.587	47.297	47	1.8504

## MF

ISO Metric fine thread DIN 13 and DIN ISO 965-1, ASME B1.13M

Nominal Size	Minor thread dia. of the internal thread (Tol. 6H)		Rec. tap drill size		
	D	P [mm]	D <sub>1</sub> min. [mm]	D <sub>1</sub> max. [mm]	[mm]
M 4 x 0.5	3.459	3.599	3.5	0.1378	
M 5 x 0.5	4.459	4.599	4.5	0.1772	
M 6 x 0.75	5.188	5.378	5.2	0.2047	
M 8 x 0.75	7.188	7.378	7.2	0.2835	
M 8 x 1	6.917	7.153	7	0.2756	
M 10 x 1	8.917	9.153	9	0.3543	
M 10 x 1.25	8.647	8.912	8.8	0.3465	
M 12 x 1.5	10.376	10.676	10.5	0.4134	
M 14 x 1.5	12.376	12.676	12.5	0.4921	
M 16 x 1.5	14.376	14.676	14.5	0.5709	
M 18 x 1.5	16.376	16.676	16.5	0.6496	
M 20 x 1.5	18.376	18.676	18.5	0.7283	
M 22 x 2	19.835	20.210	20	0.7874	
M 24 x 2	21.835	22.210	22	0.8661	
M 27 x 2	24.835	25.210	25	0.9843	
M 30 x 2	27.835	28.210	28	1.1024	
M 36 x 3	32.752	33.252	33	1.2992	
M 42 x 3	38.752	39.252	39	1.5354	
M 48 x 3	44.752	45.252	45	1.7717	
M 52 x 4	47.670	48.270	48	1.8898	

Tap drill sizes of Metric fine threads which are not listed can be found by considering the diameter difference.





## 1.16 Recommended tap drill sizes for tapping internal threads

## NPSM

American Standard straight pipe thread  
(for mechanical joints, previously NPS)  
acc. ANSI/ASME B1.20.1

Nominal Size	P [T.P.I.]	Minor thread dia. of the internal thread		Rec. tap drill size	
		D <sub>1</sub> min.	D <sub>1</sub> max.	[mm]	[inch]
1/8	27	0.358	0.364	9.1	0.3583
1/4	18	0.468	0.481	12	0.4724
3/8	18	0.603	0.612	15.5	0.6102
1/2	14	0.747	0.759	19	0.7480
3/4	14	0.958	0.970	24.5	0.9646
1	11 1/2	1.201	1.211	30.5	1.2008

## NPSC

American Standard internal straight thread  
in pipe coupling, acc. ANSI/ASME B1.20.1, Table A1

Nominal Size	P [T.P.I.]	Minor thread dia. of the internal thread	Rec. tap drill size	
			[mm]	[inch]
1/8	27	0.340	8.75	0.344
1/4	18	0.442	11.1	0.438
3/8	18	0.577	14.7	0.578
1/2	14	0.715	18.25	0.719
3/4	14	0.925	23.4	0.922
1	11 1/2	1.161	29.35	1.156

## Rp (BSPP)

Cylindrical Whitworth pipe thread  
where pressure-tight joints are made on the threads,  
acc. DIN EN 10226-1 and ISO 7-1

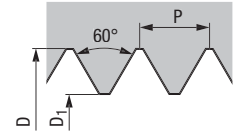
Nominal Size	P [T.P.I.]	Minor thread dia. of the internal thread		Rec. tap drill size	
		D <sub>1</sub> min. [mm]	D <sub>1</sub> max. [mm]	[mm]	[inch]
Rp 1/16	28	6.490	6.632	6.55	0.2579
Rp 1/8	28	8.495	8.637	8.6	0.3386
Rp 1/4	19	11.341	11.549	11.5	0.4528
Rp 3/8	19	14.846	15.054	15	0.5906
Rp 1/2	14	18.489	18.773	18.5	0.7283
Rp 3/4	14	23.975	24.259	24	0.9449
Rp 1	11	30.111	30.471	30.25	1.1909

## NPSF

American Standard straight pipe thread  
(dryseal internal straight pipe thread for fuel,  
combined with external tapered pipe thread NPTF or  
PTF-SAE-SHORT; Gage with tapered gages)  
acc. ANSI B1.20.3, Table B1

Nominal Size	P [T.P.I.]	Minor thread dia. of the internal thread		Rec. tap drill size	
		D <sub>1</sub> min.	[mm]	[inch]	
1/16	27	0.2482	6.25	0.246	
1/8	27	0.3406	8.6	0.339	
1/4	18	0.4422	11.15	0.438	
3/8	18	0.5776	14.7	0.578	
1/2	14	0.7133	17.85	0.703	
3/4	14	0.9238	23.4	0.922	
1	11 1/2	1.1600	29.35	1.156	

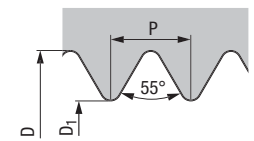
## Straight Pipe Threads



## G

Whitworth pipe thread DIN EN ISO 228

Nominal Size	P [T.P.I.]	Minor thread dia. of the internal thread		Rec. tap drill size	
		D <sub>1</sub> min. [mm]	D <sub>1</sub> max. [mm]	[mm]	[inch]
G 1/16	28	6.561	6.843	6.8	0.2677
G 1/8	28	8.566	8.848	8.8	0.3465
G 1/4	19	11.445	11.890	11.8	0.4646
G 3/8	19	14.950	15.395	15.25	0.6004
G 1/2	14	18.631	19.172	19	0.7480
G 5/8	14	20.587	21.128	21	0.8268
G 3/4	14	24.117	24.658	24.5	0.9646
G 7/8	14	27.877	28.418	28.25	1.1122
G 1	11	30.291	30.931	30.75	1.2106
G 1 1/8	11	34.939	35.579	35.5	1.3976
G 1 1/4	11	38.952	39.592	39.5	1.5551
G 1 3/8	11	41.365	42.005	41.75	1.6437
G 1 1/2	11	44.845	45.485	45.25	1.7815
G 1 5/8	11	49.030	49.670	49.5	1.9488
G 1 3/4	11	50.788	51.428	51	2.0079
G 2	11	56.656	57.296	57	2.2441
G 2 1/4	11	62.752	63.392	63.3	2.4921
G 2 1/2	11	72.226	72.866	72.8	2.8661
G 2 3/4	11	78.576	79.216	79.1	3.1142
G 3	11	84.926	85.566	85.5	3.3661



Product Finder

Vc

UNC

UNF

UNEF

UN-8

M

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

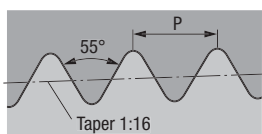
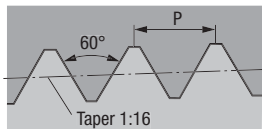
Tech. Info



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

## 1.16 Recommended tap drill sizes for tapping internal threads

### Taper Pipe Threads



### NPT

American tapered pipe thread, taper 1:16, for threads with dryseal material acc. ANSI/ASME B1.20.1

Nominal Size	P [T.P.I.]	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub> (+0.002)	t <sub>1</sub>
1/16	27	0.2421	0.2343	0.2516	0.4646
1/8	27	0.3346	0.3268	0.3441	0.4685
1/4	18	0.4331	0.4232	0.4472	0.6850
3/8	18	0.5669	0.5571	0.5827	0.6969
1/2	14	0.7008	0.6870	0.7213	0.9094
3/4	14	0.9114	0.8976	0.9319	0.9291
1	11 1/2	1.1437	1.1280	1.1689	1.1181
1 1/4	11 1/2	1.4882	1.4705	1.5138	1.1378
1 1/2	11 1/2	1.7264	1.7106	1.7528	1.1378
2	11 1/2	2.1988	2.1831	2.2268	1.1535

### NPTF

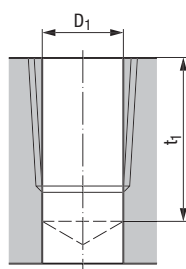
American tapered pipe thread, taper 1:16, for threads without dryseal material acc. ANSI B1.20.3

Nominal Size	P [T.P.I.]	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub> (+0.002)	t <sub>1</sub>
1/16	27	0.2402	0.2343	0.2524	0.4646
1/8	27	0.3327	0.3268	0.3449	0.4685
1/4	18	0.4291	0.4232	0.4488	0.6850
3/8	18	0.5630	0.5571	0.5843	0.6969
1/2	14	0.6929	0.6870	0.7217	0.9094
3/4	14	0.9055	0.8976	0.9323	0.9291
1	11 1/2	1.1319	1.1280	1.1701	1.1181
1 1/4	11 1/2	1.4764	1.4705	1.5150	1.1378
1 1/2	11 1/2	1.7224	1.7106	1.7539	1.1378
2	11 1/2	2.1949	2.1831	2.2280	1.1535

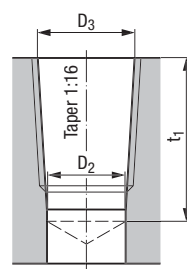
### Rc (BSPT)

Tapered Whitworth pipe thread where pressure-tight joints are made on the threads, taper 1:16, acc. DIN EN 10226-2 and ISO 7-1

Nominal Size	P [T.P.I.]	D <sub>1</sub> [mm]	D <sub>2</sub> [mm]	D <sub>3</sub> (JS11) [mm]	t <sub>1</sub> [mm]
Rc 1/16	28	6.15	6.1	6.56	11.1
Rc 1/8	28	8.15	8.1	8.57	11.1
Rc 1/4	19	10.85	10.75	11.45	16.3
Rc 3/8	19	14.3	14.25	14.95	16.7
Rc 1/2	14	17.8	17.7	18.63	22.3
Rc 3/4	14	23.2	23.1	24.12	23.6
Rc 1	11	29.2	29.1	30.29	28.3



Drill cylindrically without using a reamer



Drill cylindrically and prepare tapered hole with reamer

The minimum drilling depth t<sub>1</sub> includes the reach of screw by hand L<sub>1</sub> and the effective depth L<sub>3</sub> to ANSI/ASME B1.20.1 as well as the chamfer of the tap. Additional drilling-down has to be determined by the user according to the construction of the workpiece.

For series production it is recommended that the minor thread dia. be made as per B. Special taps are required for blind holes where the minimum depths t<sub>1</sub> as listed in the above table cannot be met. In this case please supply a sketch with blind hole dimensions along with the order.

## 1.16 Recommended tap drill sizes for tapping internal threads

## STI-UNC

Unified coarse thread ASME B18.29.1  
for wire thread inserts

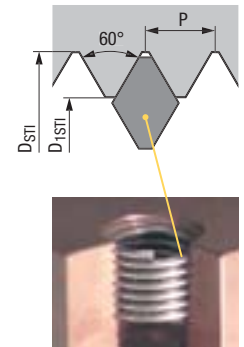
Nominal Size	Major thread dia. of the internal thread (Tol. 2B)		Minor thread dia. of the internal thread (Tol. 2B)		Rec. tap drill size
	P [T.P.I.]	D <sub>STI</sub> min.	D <sub>1STI</sub> min.	D <sub>1STI</sub> max.	
STI-No. 2	56	0.1092	0.0899	0.0961	0.0906
STI-No. 3	48	0.1261	0.1036	0.1104	0.1063
STI-No. 4	40	0.1445	0.1175	0.1252	0.1220
STI-No. 5	40	0.1575	0.1305	0.1373	0.1339
STI-No. 6	32	0.1786	0.1448	0.1527	0.1496
STI-No. 8	32	0.2046	0.1708	0.1781	0.1732
STI-No. 10	24	0.2441	0.1990	0.2080	0.2047
STI-No. 12	24	0.2701	0.2250	0.2340	0.2283
STI- 1/4	20	0.3150	0.2608	0.2704	0.2638
STI- 5/16	18	0.3847	0.3245	0.3342	0.3307
STI- 3/8	16	0.4562	0.3885	0.3987	0.3937
STI- 7/16	14	0.5303	0.4530	0.4639	0.4567
STI- 1/2	13	0.5999	0.5166	0.5273	0.5236
STI- 9/16	12	0.6708	0.5806	0.5918	0.5866
STI- 5/8	11	0.7431	0.6447	0.6564	0.6496
STI- 3/4	10	0.8799	0.7716	0.7838	0.7776
STI- 7/8	9	1.0193	0.8990	0.9119	0.9055
STI- 1	8	1.1624	1.0271	1.0421	1.0335
STI- 1 1/8	7	1.3106	1.1559	1.1730	1.1614
STI- 1 1/4	7	1.4356	1.2809	1.2980	1.2894
STI- 1 3/8	6	1.5915	1.4110	1.4310	1.4173
STI- 1 1/2	6	1.7165	1.5360	1.5560	1.5453

## STI-UNF

Unified fine thread ASME B18.29.1  
for wire thread inserts

Nominal Size	Major thread dia. of the internal thread (Tol. 2B)		Minor thread dia. of the internal thread (Tol. 2B)		Rec. tap drill size
	P [T.P.I.]	D <sub>STI</sub> min.	D <sub>1STI</sub> min.	D <sub>1STI</sub> max.	
STI-No. 2	64	0.1063	0.0894	0.0947	0.0906
STI-No. 3	56	0.1222	0.1029	0.1086	0.1063
STI-No. 4	48	0.1391	0.1166	0.1229	0.1181
STI-No. 6	40	0.1705	0.1435	0.1503	0.1457
STI-No. 8	36	0.2001	0.1701	0.1771	0.1732
STI-No. 10	32	0.2306	0.1968	0.2041	0.2008
STI- 1/4	28	0.2964	0.2577	0.2646	0.2598
STI- 5/16	24	0.3666	0.3215	0.3288	0.3248
STI- 3/8	24	0.4291	0.3840	0.3910	0.3858
STI- 7/16	20	0.5025	0.4483	0.4561	0.4528
STI- 1/2	20	0.5650	0.5108	0.5186	0.5157
STI- 9/16	18	0.6347	0.5745	0.5826	0.5787
STI- 5/8	18	0.6972	0.6370	0.6451	0.6398
STI- 3/4	16	0.8312	0.7635	0.7720	0.7677
STI- 7/8	14	0.9678	0.8905	0.8994	0.8957
STI- 1	12	1.1083	1.0181	1.0281	1.0236
STI- 1 1/8	12	1.2333	1.1431	1.1531	1.1516
STI- 1 1/4	12	1.3583	1.2681	1.2781	1.2795
STI- 1 3/8	12	1.4833	1.3931	1.4031	1.3976
STI- 1 1/2	12	1.6083	1.5181	1.5281	1.5256

## Screw Thread Insert Threads (STI)



## STI-M

ISO Metric coarse thread DIN 8140-2  
for wire thread inserts

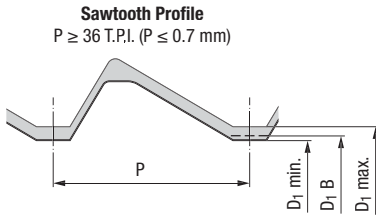
Nominal Size	Major thread dia. of the internal thread (Tol. 6H mod.)		Minor thread dia. of the internal thread (Tol. 6H mod.)		Rec. tap drill size	
	P [mm]	D <sub>STI</sub> min. [mm]	D <sub>1STI</sub> min. [mm]	D <sub>1STI</sub> max. [mm]	[mm]	[inch]
STI-M 2	0.4	2.520	2.087	2.177	2.1	0.0827
STI-M 2.5	0.45	3.084	2.597	2.697	2.65	0.1043
STI-M 3	0.5	3.650	3.108	3.220	3.15	0.1240
STI-M 4	0.7	4.910	4.152	4.292	4.2	0.1654
STI-M 5	0.8	6.040	5.174	5.334	5.25	0.2067
STI-M 6	1	7.300	6.217	6.407	6.3	0.2480
STI-M 8	1.25	9.624	8.271	8.483	8.4	0.3307
STI-M 10	1.5	11.948	10.324	10.560	10.5	0.4134
STI-M 12	1.75	14.274	12.379	12.644	12.5	0.4921
STI-M 14	2	16.598	14.433	14.733	14.5	0.5709
STI-M 16	2	18.598	16.433	16.733	16.5	0.6496
STI-M 18	2.5	21.248	18.541	18.896	18.75	0.7382
STI-M 20	2.5	23.248	20.541	20.896	20.75	0.8169
STI-M 22	2.5	25.248	22.541	22.896	22.75	0.8957
STI-M 24	3	27.897	24.649	25.049	24.75	0.9744
STI-M 27	3	30.897	27.649	28.049	27.75	1.0925
STI-M 30	3.5	34.546	30.757	31.207	31	1.2205



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

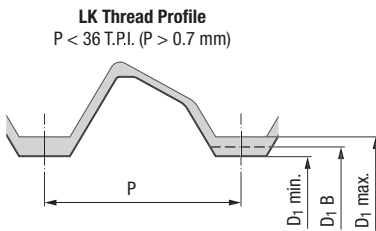
## 1.16 Recommended tap drill sizes for tapping internal threads

### Self-Locking Threads



With the Sawtooth profile the mentioned drill sizes have to be considered. If the hole diameter becomes too large, safe functioning is jeopardized.

Self-locking taps are produced with an accurate profile. The Metric LK-female thread mates with a Metric ISO bolt of grade "6g". Thread sizes of male fasteners are according to DIN 13, part 19.20.



For the specification of the maximum core hole minor diameter, as a general rule, use Line 1. For special applications, machining heavy materials for example, depth of thread is 2 x diameter, or if higher tool life is required, it is possible to use Line 2. The maximum LK-minor core hole diameter listed in Line 2 cannot be exceeded as the performance of the EMUGE SELF-LOCK system would be negatively affected. Minimum LK-minor diameters should not go below those listed.

### LK-UNC

Unified SELF-LOCK coarse thread  
EMUGE standard

Nominal Size	P [T.P.I.]	LK-Core hole dia.			D <sub>1</sub> B Drill dia. (Line 1)
		D <sub>1</sub> min.	Line 1	Line 2	
D			D <sub>1</sub> max.		
LK-No. 6	32	0.1119	0.1219	0.1217	0.1142
LK-No. 8	32	0.1378	0.1468	0.1476	0.1417
LK-No. 10	24	0.1544	0.1654	0.1675	0.1575
LK-No. 12	24	0.1804	0.1904	0.1935	0.1850
LK- 1/4	20	0.2069	0.2179	0.2226	0.2087
LK- 5/16	18	0.2644	0.2774	0.2818	0.2677
LK- 3/8	16	0.3204	0.3344	0.3400	0.3268
LK- 7/16	14	0.3748	0.3908	0.3972	0.3819
LK- 1/2	13	0.4323	0.4493	0.4564	0.4375
LK- 9/16	12	0.4887	0.5067	0.5148	0.5000
LK- 5/8	11	0.5443	0.5633	0.5728	0.5512
LK- 3/4	10	0.6609	0.6819	0.6922	0.6693

### LK-M

Metric SELF-LOCK coarse thread  
EMUGE standard

Nominal Size	P [mm]	LK-Core hole dia.			D <sub>1</sub> B Drill dia. (Line 1)	
		D <sub>1</sub> min. [mm]	Line 1 [mm]	Line 2 [mm]	[mm]	[inch]
D			D <sub>1</sub> max.			
LK-M 3	0.5	2.673	2.745	—	2.7	0.1063
LK-M 4	0.7	3.549	3.639	—	3.55	0.1398
LK-M 5	0.8	4.324	4.524	4.574	4.4	0.1732
LK-M 6	1	5.152	5.388	5.465	5.2	0.2047
LK-M 8	1.25	6.931	7.196	7.322	7	0.2756
LK-M 10	1.5	8.700	9.000	9.170	8.8	0.3465
LK-M 12	1.75	10.477	10.812	11.024	10.7	0.4213
LK-M 14	2	12.237	12.612	12.863	12.5	0.4921
LK-M 16	2	14.237	14.612	14.863	14.5	0.5709
LK-M 18	2.5	15.787	16.237	16.569	16	0.6299
LK-M 20	2.5	17.787	18.237	18.569	18	0.7087
LK-M 24	3	21.320	21.820	22.259	21.5	0.8465

It is possible to use Line 2 when machining heavy materials.

## 1.17 Decimal equivalents for tap drill selection

Inch-Wire [mm]	Decimal Inch	Inch-Wire [mm]	Decimal Inch	Inch-Wire [mm]	Decimal Inch	Inch-Wire [mm]	Decimal Inch	Inch-Wire [mm]	Decimal Inch
0.1 mm	0.0039	2.1 mm	0.0827	15	0.1800	M	0.2950	33/64	0.5156
0.2 mm	0.0079	44	0.0860	4.6 mm	0.1811	7.5 mm	0.2953	17/32	0.5313
0.3 mm	0.0118	2.2 mm	0.0866	14	0.1820	19/64	0.2969	13.5 mm	0.5315
80	0.0135	43	0.0890	13 / 4.7 mm	0.1850	7.6 mm	0.2992	35/64	0.5469
79	0.0145	2.3 mm	0.0906	3/16	0.1875	N	0.3020	14 mm	0.5512
1/64	0.0156	42	0.0935	12 / 4.8 mm	0.1890	7.7 mm	0.3031	9/16	0.5625
0.4 mm	0.0157	3/32	0.0938	11	0.1910	7.8 mm	0.3071	14.5 mm	0.5709
78	0.0160	2.4 mm	0.0945	4.9 mm	0.1929	7.9 mm	0.3110	37/64	0.5781
77	0.0180	41	0.0960	10	0.1935	5/16	0.3125	15 mm	0.5906
0.5 mm	0.0197	40	0.0980	9	0.1960	8 mm	0.3150	19/32	0.5938
76	0.0200	2.5 mm	0.0984	5 mm	0.1969	O	0.3160	39/64	0.6094
75	0.0210	39	0.0995	8	0.1990	8.1 mm	0.3189	15.5 mm	0.6102
74	0.0225	38	0.1015	5.1 mm	0.2008	8.2 mm	0.3228	5/8	0.6250
0.6 mm	0.0236	2.6 mm	0.1024	7	0.2010	P	0.3230	16 mm	0.6299
73	0.0240	37	0.1040	13/64	0.2031	8.3 mm	0.3268	41/64	0.6406
72	0.0250	2.7 mm	0.1063	6	0.2040	21/64	0.3281	16.5 mm	0.6496
71	0.0260	36	0.1065	5.2 mm	0.2047	8.4 mm	0.3307	21/32	0.6563
0.7 mm	0.0276	7/64	0.1094	5	0.2055	Q	0.3320	17 mm	0.6693
70	0.0280	35	0.1100	5.3 mm	0.2087	8.5 mm	0.3346	43/64	0.6719
69	0.0292	2.8 mm	0.1102	4	0.2090	8.6 mm	0.3386	11/16	0.6875
68	0.0310	34	0.1110	5.4 mm	0.2126	R	0.3390	17.5 mm	0.6890
1/32	0.0312	33	0.1130	3	0.2130	8.7 mm	0.3425	45/64	0.7031
0.8 mm	0.0315	2.9 mm	0.1142	5.5 mm	0.2165	11/32	0.3438	18 mm	0.7087
67	0.0320	32	0.1160	7/32	0.2188	8.8 mm	0.3465	23/32	0.7188
66	0.0330	3 mm	0.1181	5.6 mm	0.2205	S	0.3480	18.5 mm	0.7283
65	0.0350	31	0.1200	2	0.2210	8.9 mm	0.3504	47/64	0.7344
0.9 mm	0.0354	3.1 mm	0.1220	5.7 mm	0.2244	9 mm	0.3543	19 mm	0.7480
64	0.0360	1/8	0.1250	1	0.2280	T	0.3580	3/4	0.7500
63	0.0370	3.2 mm	0.1260	5.8 mm	0.2283	9.1 mm	0.3583	49/64	0.7656
62	0.0380	30	0.1285	5.9 mm	0.2323	23/64	0.3594	19.5 mm	0.7677
61	0.0390	3.3 mm	0.1299	A	0.2340	9.2 mm	0.3622	25/32	0.7813
1.0 mm	0.0394	3.4 mm	0.1339	15/64	0.2344	9.3 mm	0.3661	20 mm	0.7874
60	0.0400	29	0.1360	6 mm	0.2362	U	0.3680	51/64	0.7969
59	0.0410	3.5 mm	0.1378	B	0.2380	9.4 mm	0.3701	20.5 mm	0.8071
58	0.0420	28	0.1405	6.1 mm	0.2402	9.5 mm	0.3740	13/16	0.8125
57	0.0430	9/64	0.1406	C	0.2420	3/8	0.3750	21 mm	0.8268
56	0.0465	3.6 mm	0.1417	6.2 mm	0.2441	V	0.3770	53/64	0.8281
3/64	0.0469	27	0.1440	D	0.2460	9.6 mm	0.3780	27/32	0.8438
1.2 mm	0.0472	3.7 mm	0.1457	6.3 mm	0.2480	9.7 mm	0.3819	21.5 mm	0.8465
1.3 mm	0.0512	26	0.1470	1/4 / E	0.2500	9.8 mm	0.3858	55/64	0.8594
55	0.0520	25	0.1495	6.4 mm	0.2520	W	0.3860	22 mm	0.8661
54	0.0550	3.8 mm	0.1496	6.5 mm	0.2559	9.9 mm	0.3898	7/8	0.8750
1.4 mm	0.0551	24	0.1520	F	0.2570	25/64	0.3906	22.5 mm	0.8858
1.5 mm	0.0591	3.9 mm	0.1535	6.6 mm	0.2598	10 mm	0.3937	57/64	0.8906
53	0.0595	23	0.1540	G	0.2610	X	0.3970	23 mm	0.9055
1/16	0.0625	5/32	0.1563	6.7 mm	0.2638	Y	0.4040	29/32	0.9063
1.6 mm	0.0630	22	0.1570	17/64	0.2656	13/32	0.4063	59/64	0.9219
52	0.0635	4 mm	0.1575	H	0.2660	Z	0.4130	23.5 mm	0.9252
1.7 mm	0.0669	21	0.1590	6.8 mm	0.2677	10.5 mm	0.4134	15/16	0.9375
51	0.0670	20	0.1610	6.9 mm	0.2717	27/64	0.4219	24 mm	0.9449
50	0.0700	4.1 mm	0.1614	I	0.2720	11 mm	0.4331	61/64	0.9531
1.8 mm	0.0709	4.2 mm	0.1654	7 mm	0.2756	7/16	0.4375	24.5 mm	0.9646
49	0.0730	19	0.1660	J	0.2770	11.5 mm	0.4528	31/32	0.9688
1.9 mm	0.0748	4.3 mm	0.1693	7.1 mm	0.2795	29/64	0.4531	25 mm	0.9843
48	0.0760	18	0.1695	K	0.2810	15/32	0.4688	63/64	0.9844
5/64	0.0781	11/64	0.1719	9/32	0.2813	12 mm	0.4724	1	1.0000
47	0.0785	17	0.1730	7.2 mm	0.2835	31/64	0.4844		
2 mm	0.0787	4.4 mm	0.1732	7.3 mm	0.2874	12.5 mm	0.4921		
46	0.0810	16	0.1770	L	0.2900	1/2	0.5000		
45	0.0820	4.5 mm	0.1772	7.4 mm	0.2913	13 mm	0.5118		

The tap drill sizes shown are reference values and may have to be altered to meet specific tapping requirements. EMUGE shall have no liability or responsibility of any kind resulting from the selection of a tap drill size from this chart. Values printed are correct at the time of printing and subject to change without notice.

Product  
FinderV<sub>c</sub>

UNC

UNF

UNEF

UN-8

MF

NPSM/NPSC

NPSF

Rp (BSPP)

G

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info**

### 1.18 Conversion table SFM to RPM for taps

#### UNC/UNF and NPT/NPTF

Tap Sizes			Surface Feet per Minute																	
			5'	10'	15'	20'	25'	30'	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'
UNC UNF	NPT NPTF		Revolutions per Minute																	
			No. 0			318	637	955	1273	1592	1910	2546	3183	3820	4456	5093	5729	6366	7003	7639
No. 1			273	546	819	1046	1308	1570	2093	2617	3140	3663	4186	4710	5233	5756	6279	6805	7326	7849
No. 2			212	424	637	888	1110	1333	1777	2221	2665	3109	3554	3999	4442	4886	5330	5774	6218	6662
No. 3			191	382	573	772	964	1157	1543	1929	2315	2701	3086	3472	3858	4244	4629	5015	5401	5787
No. 4			174	347	521	682	853	1023	1364	1705	2046	2387	2728	3069	3411	3751	4092	4434	4775	5116
No. 5			147	294	441	611	764	917	1222	1528	1833	2139	2445	2750	3056	3361	3667	3973	4278	4584
No. 6			136	273	409	553	691	829	1106	1382	1659	1935	2212	2488	2766	3042	3318	3595	3871	4148
No. 8			119	239	358	466	583	699	932	1165	1398	1631	1864	2097	2330	2563	2796	3029	3262	3495
No. 10			101	201	302	402	502	603	804	1005	1205	1406	1607	1808	2009	2210	2411	2612	2813	3014
No. 12			87	174	260	354	442	531	707	884	1061	1238	1415	1592	1769	1945	2122	2300	2476	2653
1/4			76	153	229	306	382	458	611	764	917	1070	1222	1375	1528	1681	1833	1986	2139	2292
5/16			62	123	185	245	306	367	489	611	733	856	978	1100	1222	1345	1467	1589	1711	1833
3/8			50	101	151	204	255	305	407	509	611	713	815	917	1019	1120	1222	1324	1426	1528
7/16	1/8		43	87	130	175	219	262	349	437	524	611	698	786	873	960	1048	1135	1222	1310
1/2			38	76	115	153	191	229	305	382	458	535	611	688	764	840	917	993	1070	1146
9/16	1/4		34	68	102	137	172	206	274	342	410	478	547	616	683	752	820	888	952	1020
5/8			32	64	96	122	153	183	244	306	367	428	489	550	611	672	733	794	856	917
11/16	3/8		28	55	83	111	138	167	222	278	333	389	444	500	556	611	667	722	778	833
3/4			25	51	76	102	128	153	203	255	305	357	407	458	509	560	611	662	713	764
7/8	1/2		22	43	65	87	109	131	175	218	262	306	350	392	437	480	524	568	611	655
1			19	38	57	76	96	115	153	191	230	268	305	344	382	420	458	497	535	573
1 1/8	3/4		17	34	51	68	84	102	136	170	204	238	272	306	340	373	407	441	475	509
1 1/4			15	31	46	61	76	92	122	153	183	214	244	275	305	336	367	397	428	458
1 3/8	1		14	28	42	56	69	83	111	139	167	194	222	250	278	306	333	361	389	417
1 1/2			13	25	38	51	63	76	102	127	153	178	204	229	255	280	305	331	356	382
1 5/8			12	23	35	47	59	71	94	118	141	165	188	212	235	259	282	306	329	353
1 3/4			11	22	33	44	55	65	87	109	131	153	175	196	218	240	262	284	306	327
1 7/8			10	20	30	41	51	61	81	102	122	143	163	183	204	224	244	265	285	306
2			9	19	29	38	48	57	76	96	115	134	153	172	191	210	229	248	267	287

#### Metric Taps

M 1	490	979	1469	1959	2449	2938	3918	4897	5877	6856	7836	8815	9795	10774	11754	12733	13713	14692
M 2	242	484	725	967	1209	1451	1934	2418	2901	3385	3868	4352	4835	5319	5803	6286	6770	7253
M 3	162	324	486	647	809	971	1295	1619	1942	2266	2590	2914	3237	3561	3885	4208	4532	4856
M 3.5	138	277	415	554	692	830	1107	1384	1661	1938	2214	2491	2768	3045	3322	3599	3875	4152
M 4	122	243	365	487	608	730	973	1217	1460	1703	1946	2190	2433	2676	2920	3163	3406	3650
M 5	97	194	291	388	485	582	776	970	1163	1357	1551	1745	1939	2133	2327	2521	2715	2909
M 6	81	162	243	324	405	486	647	809	971	1133	1295	1457	1619	1781	1942	2104	2266	2428
M 7	69	138	208	277	346	415	554	692	830	969	1107	1246	1384	1522	1661	1799	1938	2076
M 8	61	121	182	243	303	364	485	606	728	849	970	1091	1213	1334	1455	1577	1698	1819
M 10	48	97	145	194	242	291	388	485	582	679	776	873	970	1067	1163	1260	1357	1454
M 12	40	81	121	162	202	243	324	405	486	567	647	728	809	890	971	1052	1133	1214
M 14	35	69	104	139	173	208	277	347	416	485	555	624	693	763	832	901	971	1040
M 16	30	61	91	121	152	182	243	303	364	424	485	546	606	667	728	788	849	910
M 18	27	54	81	108	135	162	216	269	323	377	431	485	539	593	647	700	754	808
M 20	24	49	73	97	121	146	194	243	291	340	388	437	485	534	582	631	680	728
M 22	22	44	66	88	110	132	176	221	265	309	353	397	441	485	529	573	618	662
M 24	20	40	61	81	101	121	162	202	243	283	323	364	404	445	485	526	566	606
M 27	18	36	54	72	90	108	144	180	216	252	287	323	359	395	431	467	503	539
M 30	16	32	49	65	81	97	129	162	194	226	259	291	323	356	388	420	453	485

For tap sizes not listed, please contact an EMUGE Technical Representative at 800-323-3013.

## 1.19 Troubleshooting guide for tapping

Problem: Tapping oversized threads (no-go gage too loose)	
Possible Cause	Possible Remedy
<ul style="list-style-type: none"> <li>Improper tap for material and thread application.</li> </ul>	<ul style="list-style-type: none"> <li>Use a suitable tap for the hole style and material being tapped. Reference the EMUGE Tap Finder for proper selection.</li> </ul>
<ul style="list-style-type: none"> <li>Cutting speed too high.</li> </ul>	<ul style="list-style-type: none"> <li>Reduce cutting speed.</li> <li>Improve coolant/lubrication.</li> </ul>
<ul style="list-style-type: none"> <li>Cold welding on the flanks of the tap (loading).</li> </ul>	<ul style="list-style-type: none"> <li>Use a new tool.</li> <li>Use surface treated taps.</li> <li>Improve coolant/lubrication.</li> <li>Grind away chipped and damaged teeth.</li> </ul>
<ul style="list-style-type: none"> <li>Chip packing in flutes.</li> </ul>	<ul style="list-style-type: none"> <li>Use tap holders with different flute geometry/angle.</li> <li>Possibly use set of taps.</li> </ul>
<ul style="list-style-type: none"> <li>Grinding burr.</li> </ul>	<ul style="list-style-type: none"> <li>Remove burr with soft wire or fiber brush.</li> </ul>
<ul style="list-style-type: none"> <li>Incorrect fixturing or positioning of part.</li> </ul>	<ul style="list-style-type: none"> <li>Use tap holders with axial and parallel floating.</li> <li>Check clamping of part for correct alignment.</li> </ul>
<ul style="list-style-type: none"> <li>Inconsistent feed of tap.</li> </ul>	<ul style="list-style-type: none"> <li>Tap with controlled feed.</li> <li>Check CNC programs.</li> <li>Check lead screw for backlash.</li> <li>Use compensating tension/compression tap holder.</li> </ul>

Problem: Tapping oversized threads (no-go gage loose)	
Possible Cause	Possible Remedy
<ul style="list-style-type: none"> <li>Tap selected too large for class of thread fit required.</li> </ul>	<ul style="list-style-type: none"> <li>Review markings on tap and determine if it is suitable for the class of fit required.</li> <li>If in doubt, contact an EMUGE Representative.</li> </ul>
<ul style="list-style-type: none"> <li>Improper reconditioning of tap.</li> </ul>	<ul style="list-style-type: none"> <li>Reconditioning of tap requires that all ground surfaces maintain the original geometry put on by the manufacturer.</li> <li>Contact an EMUGE Representative for instructive information.</li> </ul>

Problem: Tapping bellmouthed hole (first few threads gage oversize)	
Possible Cause	Possible Remedy
<ul style="list-style-type: none"> <li>Wrong initial starting pressure.</li> </ul>	<ul style="list-style-type: none"> <li>Work with controlled tap feed.</li> </ul>
<ul style="list-style-type: none"> <li>Axially hard working spindle.</li> </ul>	<ul style="list-style-type: none"> <li>Use a tap holder with length compensation.</li> </ul>
<ul style="list-style-type: none"> <li>Incorrect fixturing or positioning of part.</li> </ul>	<ul style="list-style-type: none"> <li>Use a tap holder with axial and parallel floating.</li> <li>Check clamping of part for correct alignment.</li> </ul>

EMUGE Taps are very free cutting and will easily cut oversize threads if overfed or pushed. For the best results, we recommend the use of an EMUGE Quick-Change Tap Holder with built-in tension, compression and overload clutch features. Always utilize your holder's tension feature by programming spindle feed to 95-98% of the calculated feed rate.

**Call an EMUGE Representative at 800 323 3013 if you need assistance.**

Problem: Torn and rough threads	
Possible Cause	Possible Remedy
<ul style="list-style-type: none"> <li>Improper selection of tap for material and thread application.</li> </ul>	<ul style="list-style-type: none"> <li>Use a suitable tap for the hole style and material being tapped. Reference the EMUGE Tap Finder for proper selection.</li> </ul>
<ul style="list-style-type: none"> <li>Cutting speed too fast or slow.</li> </ul>	<ul style="list-style-type: none"> <li>Select proper cutting speed.</li> <li>Improve coolant selection to assist the effects of tap speed.</li> </ul>
<ul style="list-style-type: none"> <li>Cold welding on the flanks of the tap (loading).</li> </ul>	<ul style="list-style-type: none"> <li>Use a new tool.</li> <li>Use surface treated taps.</li> <li>Improve coolant/lubrication.</li> <li>Find away chipped and damaged teeth.</li> </ul>
<ul style="list-style-type: none"> <li>Chips packing in flutes.</li> </ul>	<ul style="list-style-type: none"> <li>Use tap with different flute geometry/angle.</li> <li>Use set of taps.</li> </ul>
<ul style="list-style-type: none"> <li>Grinding burr.</li> </ul>	<ul style="list-style-type: none"> <li>Remove burr with soft wire or brush.</li> </ul>
<ul style="list-style-type: none"> <li>Tap drill too small.</li> </ul>	<ul style="list-style-type: none"> <li>Use correct size drill.</li> <li>Reference recommended sizes listed in EMUGE catalog. Note that cutting and roll form taps use different size tap drills for the same size thread.</li> <li>If in doubt, contact an EMUGE Representative.</li> </ul>
<ul style="list-style-type: none"> <li>Insufficient coolant/ lubrication.</li> </ul>	<ul style="list-style-type: none"> <li>Selection of suitable coolant/lubrication for material being tapped.</li> <li>Use adequate amounts of coolant/lubrication.</li> <li>Use a set of taps.</li> </ul>
<ul style="list-style-type: none"> <li>Tool overloading due to coarse pitch, hard materials or short chamfers.</li> </ul>	<ul style="list-style-type: none"> <li>Use a set of taps.</li> </ul>

Problem: Tapping undersized threads (go gage won't enter/binds up part way into hole)	
Possible Cause	Possible Remedy
<ul style="list-style-type: none"> <li>Tap selected too small to do multiple regrinds.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the number of regrinds a tap has.</li> <li>Use a new tap.</li> </ul>
<ul style="list-style-type: none"> <li>Area of wear not removed when tap was resharpened.</li> </ul>	<ul style="list-style-type: none"> <li>Grind tap again.</li> <li>Use a new tap.</li> </ul>
<ul style="list-style-type: none"> <li>Improper tap for material and thread application.</li> </ul>	<ul style="list-style-type: none"> <li>Use suitable tap for the hole style and material being tapped.</li> <li>Reference the EMUGE Tap Finder for proper selection.</li> </ul>
<ul style="list-style-type: none"> <li>Go gage binds up part way into hole.</li> </ul>	<ul style="list-style-type: none"> <li>Tap is dull – recondition or replace tap.</li> <li>Avoid too much axial force during tapping operation (this caused the tap to cut out of lead)</li> <li>Use tap holders with length compensation.</li> </ul>
<ul style="list-style-type: none"> <li>Tap selected too small for class of thread fit required.</li> </ul>	<ul style="list-style-type: none"> <li>Review markings on tap and determine if it is suitable for class of fit required.</li> <li>If in doubt, contact an EMUGE Representative.</li> </ul>

Problem: Tap life too low	
Possible Cause	Possible Remedy
<ul style="list-style-type: none"> <li>All reasons stated in torn and rough threads.</li> </ul>	<ul style="list-style-type: none"> <li>See torn and rough threads.</li> </ul>
<ul style="list-style-type: none"> <li>Loss of tap hardness by excess heat during regrinding.</li> </ul>	<ul style="list-style-type: none"> <li>Change the specification of the grinding wheel.</li> <li>Use coolant while grinding.</li> </ul>
<ul style="list-style-type: none"> <li>Loss of surface treatment from regrinding.</li> </ul>	<ul style="list-style-type: none"> <li>Retreatment of the tap surface.</li> <li>Check suitability of surface treatment for material being tapped.</li> </ul>
<ul style="list-style-type: none"> <li>Work hardened drill hole and hole chamfer.</li> </ul>	<ul style="list-style-type: none"> <li>Change or regrind tap drill more frequently.</li> <li>Check proper drilling speed and feed.</li> <li>Anneal part before tapping.</li> </ul>

Problem: Tap breakage	
Possible Cause	Possible Remedy
<ul style="list-style-type: none"> <li>Improper selection of tap for material and threading application.</li> </ul>	<ul style="list-style-type: none"> <li>Use a suitable tap for the hole style and material being tapped.</li> <li>Reference the EMUGE Tap Finder for proper selection.</li> </ul>
<ul style="list-style-type: none"> <li>Tap drill too small.</li> </ul>	<ul style="list-style-type: none"> <li>Use correct size drill. Recommended size drills listed in EMUGE catalog. Note that cutting and roll form taps use different size tap drills for same size thread.</li> <li>If in doubt, contact an EMUGE Representative.</li> </ul>
<ul style="list-style-type: none"> <li>Tap hole not deep enough.</li> </ul>	<ul style="list-style-type: none"> <li>Check actual drill depth, drill may have slipped back into holder.</li> </ul>
<ul style="list-style-type: none"> <li>Missing tap drill hole.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure tap drill hole is present. Common problem in multiple spindle applications on transfer lines.</li> </ul>
<ul style="list-style-type: none"> <li>Chips packing in flutes.</li> </ul>	<ul style="list-style-type: none"> <li>Use tap with different flute geometry/angle.</li> <li>Use a set of taps.</li> </ul>
<ul style="list-style-type: none"> <li>Cutting speed too high or low.</li> </ul>	<ul style="list-style-type: none"> <li>Select proper cutting speed.</li> <li>Improve coolant/lubrication to assist the effects of the tap speed.</li> </ul>
<ul style="list-style-type: none"> <li>Cold welding on the flanks of the tap (loading).</li> </ul>	<ul style="list-style-type: none"> <li>Use a new tool.</li> <li>Use surface treated taps.</li> <li>Improve coolant/lubrication.</li> <li>Grind away chipped and damaged teeth.</li> </ul>
<ul style="list-style-type: none"> <li>Overload of the chamfer teeth.</li> </ul>	<ul style="list-style-type: none"> <li>Use longer chamfer.</li> <li>Increase number of tap flutes to provide more chamfered teeth.</li> </ul>
<ul style="list-style-type: none"> <li>Incorrect fixturing or positioning of part.</li> </ul>	<ul style="list-style-type: none"> <li>Use tap holders with axial/parallel floating.</li> <li>Check clamping of part for correct alignment.</li> </ul>
<ul style="list-style-type: none"> <li>Tap hitting the bottom of hole.</li> </ul>	<ul style="list-style-type: none"> <li>Use tap holder with length compensation and torque overload system.</li> </ul>
<ul style="list-style-type: none"> <li>Tapping hard or high tensile materials.</li> </ul>	<ul style="list-style-type: none"> <li>Check selection of tap, carbide tap may be more suitable than high speed steel taps.</li> </ul>



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UNEF
- UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info







## Roll Form Taps

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- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info



### **Cut&Form – Production of internal threads by a combination of machining and cold forming**

The internal thread production system Cut&Form is a combination of machining and cold-forming processes which each produce a specific part of the thread profile.

- Strengthened threads and increased long-term resistance
- Cold forming of large threads with coarse pitch
- Cold forming of threads in difficult materials
- Production of a narrow-tolerance minor diameter without space pocket
- Extra smooth thread surfaces

Roll Form Taps  
with Reinforced Shank



**Druck 1  
InnoForm 1**

DIN Length  
ANSI Shank

DIN Length  
DIN Shank

Roll Form Taps  
with Reduced Shank



**Druck 2  
InnoForm 2**

DIN Length  
ANSI Shank

DIN Length  
DIN Shank

Short  
Roll Form Taps



**Druck**

ANSI Length  
ANSI Shank

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			170		<b>G</b>
	171				<b>LK-M</b>

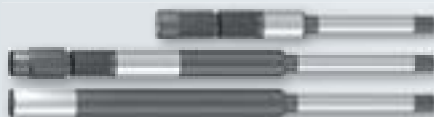
Page

Tapping Fluid



115

Special Shank Extensions



116 - 120




- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

### Product finder and cutting data

**Please note:**

The circumferential speeds (v<sub>c</sub> in SFM) listed in the respective columns are standard values which have to be adjusted to individual work conditions (material, lubrication, machine etc.).

-  = Suitable coolant-lubricant
- E = Emulsion
- O = Thread cutting oil
- P = Thread cutting paste
- M = Minimum quantity lubrication (MQL)



Thread Depth and Hole Type

- UNC
- UNF
- UNEF, UN-8
- M
- MF
- NPSM/NPSC
- NPSF
- Rp (BSPP)
- G
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK

The suitability is marked as follows:

- Preferred suitable roll form tap
- Suitable roll form tap



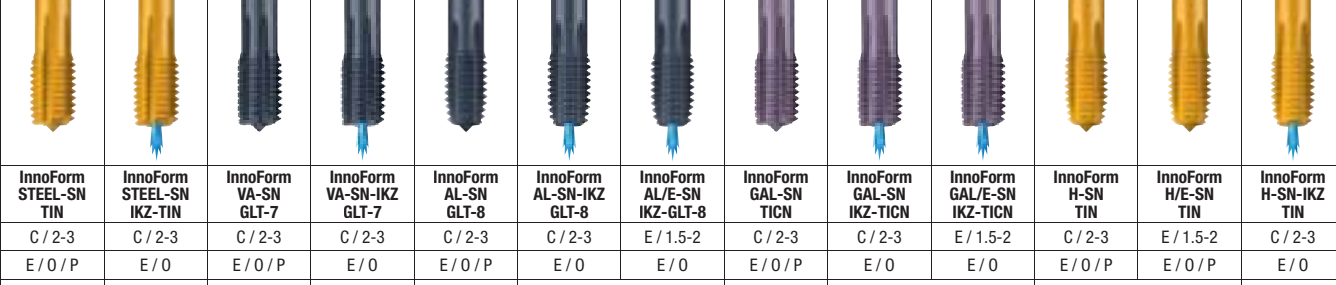
= DIN form / threads (Lead taper length)

Application – Material		Hardness Range			Material Examples
		HRC	BHN	N/mm <sup>2</sup>	
<b>P</b>	<b>Steel materials</b>				
	1.1 Cold-extrusion steels, Construction steels, Free-cutting steels, etc.		≤ 180	≤ 600	1010 / 1018 / 1020 / 12L14 / 12L15 / A36 / T1
	2.1 Construction steels, Cementation steels, Steel castings, etc.	≤ 22	≤ 235	≤ 800	A36 / T1 / 1030-1095 / 4140 / 4340 / 8620
	3.1 Cementation steels, Heat-treatable steels, Cold work steels, etc.	≤ 31	≤ 295	≤ 1000	4140 / 4340 / 8620 / P20 / H13 / D2 / A2 / S7 / H1150
	4.1 Heat-treatable steels, Cold work steels, Nitriding steels, etc.	≤ 38	≤ 355	≤ 1200	4140 / 4340 / 8620 / P20 / H13 / D2 / 300M / 52100 / M1-M42
5.1 High-alloyed steels, Cold work steels, Hot work steels, etc.	≤ 44	≤ 415	≤ 1400	4140 / 4340 / 8620 / P20 / H13 / D2 / 300M / 52100	
<b>M</b>	<b>Stainless steel materials</b>				
	1.1 Ferritic, martensitic	≤ 29	≤ 280	≤ 950	410 / 440 / 440C / 17-4 PH
	2.1 Austenitic	≤ 29	≤ 280	≤ 950	303 / 304 / 316 / 316L / 321
	3.1 Austenitic-ferritic (Duplex)	≤ 35	≤ 325	≤ 1100	
	4.1 Austenitic-ferritic heat-resistant (Super Duplex)	≤ 39	≤ 370	≤ 1250	
<b>K</b>	<b>Cast materials</b>				
	1.1 Cast iron with lamellar graphite (GJL)		30 - 75	100 - 250	Grey cast irons G10-GG40
	1.2		75 - 135	250 - 450	
	2.1 Cast iron with nodular graphite (GJS)		105 - 150	350 - 500	Nodular GGG40-GGG70
	2.2		150 - 265	500 - 900	
	3.1 Cast iron with vermicular graphite (GJV)		90 - 120	300 - 400	
	3.2		120 - 150	400 - 500	Compact graphite iron (CGI)
4.1 Malleable cast iron (GTMW, GTMB)		70 - 145	250 - 500		
4.2		150 - 235	500 - 800	White iron	
<b>N</b>	<b>Non ferrous materials</b>				
	<b>Aluminium alloys</b>				
	1.1		≤ 60	≤ 200	7075
	1.2 Aluminium wrought alloys		≤ 105	≤ 350	6061-T6 / 2024-T4
	1.3		≤ 165	≤ 550	
	1.4 Aluminium cast alloys Si ≤ 7%				
	1.5 Aluminium cast alloys 7% < Si ≤ 12%				
	1.6 Aluminium cast alloys 12% < Si ≤ 17%				
	<b>Copper alloys</b>				
	2.1 Pure copper, low-alloyed copper		≤ 120	≤ 400	
	2.2 Copper-zinc alloys (brass, long-chipping)		≤ 165	≤ 550	
	2.3 Copper-zinc alloys (brass, short-chipping)		≤ 165	≤ 550	
	2.4 Copper-aluminium alloys (alu bronze, long-chipping)		≤ 235	≤ 800	
	2.5 Copper-tin alloys (tin bronze, long-chipping)		≤ 205	≤ 700	
	2.6 Copper-tin alloys (tin bronze, short-chipping)		≤ 120	≤ 400	
	2.7		≤ 180	≤ 600	
	2.8 Special copper alloys	≤ 44	≤ 415	≤ 1400	
	<b>Magnesium alloys</b>				
	3.1 Magnesium wrought alloys		≤ 150	≤ 500	
	3.2 Magnesium cast alloys		≤ 150	≤ 500	
<b>Synthetics</b>					
4.1 Duroplastics (short-chipping)					
4.2 Thermoplastics (long-chipping)					
4.3 Fibre-reinforced synthetics (fibre content ≤ 30%)					
4.4 Fibre-reinforced synthetics (fibre content > 30%)					
<b>Special materials</b>					
5.1 Graphite					
5.2 Tungsten-copper alloys					
5.3 Composite materials					
<b>S</b>	<b>Special materials</b>				
	<b>Titanium alloys</b>				
	1.1 Pure titanium		≤ 135	≤ 450	CP1 / CP2
	1.2 Titanium alloys	≤ 27	≤ 265	≤ 900	6AL4V
	1.3	≤ 39	≤ 370	≤ 1250	
	<b>Nickel alloys, cobalt alloys and iron alloys</b>				
	2.1 Pure nickel		≤ 180	≤ 600	
	2.2 Nickel-base alloys	≤ 31	≤ 295	≤ 1000	Monel 500
	2.3	≤ 49	≤ 475	≤ 1600	718 Inconel
	2.4	≤ 31	≤ 295	≤ 1000	
	2.5 Cobalt-base alloys	≤ 49	≤ 475	≤ 1600	Haynes 25
	2.6 Iron-base alloys	≤ 46	≤ 445	≤ 1500	Incoloy 925
<b>H</b>	<b>Hard materials</b>				
	1.1	44 - 50			
	1.2	50 - 55			
	1.3	55 - 60			
	1.4	60 - 63			
	1.5	63 - 66			

Druck STEEL	Druck STEEL-SN	Druck STEEL CR	Druck STEEL TIN	Druck STEEL-SN TIN	Druck STEEL/E SN-TIN	Druck STEEL-SN IKZ-TIN	Druck STEEL-SN IKZN-TIN	Druck STEEL/E SN-TICN	Druck Z-SN TIN-T1	Druck Z-SN-IKZ TIN-T1	Druck Z-SN-IKZN TIN-T1							
C / 2-3	C / 2-3	C / 2-3	C / 2-3	C / 2-3	E / 1.5-2	C / 2-3	C / 2-3	E / 1.5-2	C / 2-3	C / 2-3	C / 2-3							
O / P	O / P	E / O	E / O / P	E / O / P	E / O / P	E / O	E / O	E / O / P	E / O / P	E / O	E / O							
			max. 3 x d <sub>1</sub> 			max. 3 x d <sub>1</sub> 			max. 3 x d <sub>1</sub> 			max. 3 x d <sub>1</sub> 			max. 3 x d <sub>1</sub> 			Thread Depth and Hole Type
	150 156			150, 155 156, 161	150 156	150 156		150 156	151 157	151 157	151 157	UNC UNF UNEF, UN-8 M MF NPSM/NPSC NPSF Rp (BSPP) G NPT NPTF Rc (BSPT) STI SELF-LOCK						
162 168	162, 167 168	162	162 168	163, 167 168		163 168	163 169											
170			170	170														
171			171															
49 - 148	49 - 148		<b>66 - 262</b>	<b>66 - 262</b>	<b>66 - 262</b>	<b>66 - 262</b>	<b>66 - 262</b>	<b>66 - 262</b>	<b>20 - 80</b>	<b>20 - 80</b>	<b>20 - 80</b>	1.1						
<b>33 - 131</b>	<b>33 - 131</b>		<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>	<b>20 - 60</b>	<b>20 - 60</b>	<b>20 - 60</b>	2.1						
16 - 82	16 - 82		33 - 131	33 - 131	33 - 131	33 - 131	33 - 131	33 - 131	<b>10 - 40</b>	<b>10 - 40</b>	<b>10 - 40</b>	3.1						
									<b>10 - 30</b>	<b>10 - 30</b>	<b>10 - 30</b>	4.1						
												5.1						
			33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	10 - 25 <sup>2)</sup>	10 - 25 <sup>2)</sup>	10 - 25 <sup>2)</sup>	1.1						
			33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	10 - 25 <sup>2)</sup>	10 - 25 <sup>2)</sup>	10 - 25 <sup>2)</sup>	2.1						
									5 - 20 <sup>2)</sup>	5 - 20 <sup>2)</sup>	5 - 20 <sup>2)</sup>	3.1						
												4.1						
												1.1						
												1.2						
									20 - 60	20 - 60	20 - 60	2.1						
												2.2						
												3.1						
												3.2						
												4.1						
												4.2						
		49 - 131 <b>49 - 131</b> 49 - 131 49 - 131										1.1						
												1.2						
												1.3						
			66 - 197 66 - 197	66 - 197 66 - 197	66 - 197 66 - 197	66 - 197 66 - 197	66 - 197 66 - 197	66 - 197 66 - 197				1.4						
												1.5						
												1.6						
		<b>16 - 98</b> <b>66 - 197</b>	66 - 131 131 - 262	66 - 131 131 - 262	66 - 131 131 - 262	66 - 131 131 - 262	66 - 131 131 - 262	66 - 131 131 - 262	<b>20 - 40</b> <b>40 - 80</b>	<b>20 - 40</b> <b>40 - 80</b>	<b>20 - 40</b> <b>40 - 80</b>	2.1						
												2.2						
												2.3						
									20 - 40	20 - 40	20 - 40	2.4						
									<b>20 - 40</b>	<b>20 - 40</b>	<b>20 - 40</b>	2.5						
												2.6						
												2.7						
												2.8						
												3.1						
												3.2						
												4.1						
												4.2						
												4.3						
												4.4						
												5.1						
												5.2						
												5.3						
									5 - 20 <sup>2)</sup>	5 - 20 <sup>2)</sup>	5 - 20 <sup>2)</sup>	1.1						
									5 - 15 <sup>2)</sup>	5 - 15 <sup>2)</sup>	5 - 15 <sup>2)</sup>	1.2						
									5 - 10 <sup>2)</sup>	5 - 10 <sup>2)</sup>	5 - 10 <sup>2)</sup>	1.3						
												2.1						
									<b>5 - 15 <sup>2)</sup></b>	<b>5 - 15 <sup>2)</sup></b>	<b>5 - 15 <sup>2)</sup></b>	2.2						
									5 - 10 <sup>2)</sup>	5 - 10 <sup>2)</sup>	5 - 10 <sup>2)</sup>	2.3						
												2.4						
									5 - 10 <sup>2)</sup>	5 - 10 <sup>2)</sup>	5 - 10 <sup>2)</sup>	2.5						
												2.6						
												1.1						
												1.2						
												1.3						
												1.4						
												1.5						



- Product Finder
- Vc
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info



	InnoForm STEEL-SN TIN	InnoForm STEEL-SN IKZ-TIN	InnoForm VA-SN GLT-7	InnoForm VA-SN-IKZ GLT-7	InnoForm AL-SN GLT-8	InnoForm AL-SN-IKZ GLT-8	InnoForm AL/E-SN IKZ-GLT-8	InnoForm GAL-SN TiCN	InnoForm GAL-SN IKZ-TiCN	InnoForm GAL/E-SN IKZ-TiCN	InnoForm H-SN TIN	InnoForm H/E-SN TIN	InnoForm H-SN-IKZ TIN
	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3	E/1.5-2	C/2-3	C/2-3	E/1.5-2	C/2-3	E/1.5-2	C/2-3
	E/O/P	E/O	E/O/P	E/O	E/O/P	E/O	E/O	E/O/P	E/O	E/O	E/O/P	E/O/P	E/O
Thread Depth and Hole Type	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 	max. 3 x d <sub>1</sub> 
UNC	152	152	152	152	152	153	153	153	153	153			
UNF	158	158	158	158	158	159	159	159	159	159			
UNEF, UN-8	163	163	164	164	164	164	164	165	165	165	165	165	165
M													
MF													
G													
SELF-LOCK													
NPSM/NPSC													
NPSF													
Rp (BSPP)													
G													
NPT													
NPTF													
Rc (BSPT)													
STI													
SELF-LOCK													

<b>P</b>	1.1	<b>66 - 262</b>	<b>66 - 262</b>	66 - 262	66 - 262								
	2.1	<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>						66 - 197	66 - 197	66 - 197
	3.1	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>						<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>
	4.1	33 - 98	33 - 98	33 - 98	33 - 98						<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>
	5.1										<b>16 - 66</b>	<b>16 - 66</b>	<b>16 - 66</b>







<b>M</b>	1.1			<b>33 - 82 2)</b>	<b>33 - 82 2)</b>								
	2.1			<b>33 - 82 2)</b>	<b>33 - 82 2)</b>								
	3.1			16 - 66 2)	16 - 66 2)								
	4.1												

<b>K</b>	1.1												
	1.2												
	2.1	66 - 197	66 - 197								<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>
	2.2												
	3.1												
	3.2												
	4.1												
	4.2												

<b>N</b>	1.1					<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>					
	1.2					<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>					
	1.3					<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>					
	1.4					66 - 197	66 - 197	66 - 197	<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>		
	1.5								<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>		
	1.6								66 - 131	66 - 131	66 - 131		
	2.1					<b>66 - 131</b>	<b>66 - 131</b>	<b>66 - 131</b>					
	2.2					131 - 262	131 - 262	131 - 262					
	2.3												
	2.4												
	2.5												
	2.6												
	2.7												
	2.8												
	3.1												
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4.4													
5.1													
5.2													
5.3													

<b>S</b>	1.1												
	1.2												
	1.3												
	2.1												
	2.2												
	2.6												

<b>H</b>	1.1												
	1.2												
	1.3												
	1.4												
	1.5												

						Carbide Roll Form Taps				
InnoForm H-SN TIN-T26	InnoForm H-SN- IKZ TIN-T26	InnoForm Z-SN TIN-T1	InnoForm Z/E-SN TIN-T1	InnoForm Z-SN- IKZ TIN-T1	InnoForm Z/E-SN- IKZ TIN-T1	VHM Druck STEEL-SN- IKZ	VHM InnoForm Z-SN- IKZ-TIN-T1	VHM InnoForm Z/E-SN- IKZ-TIN-T1		
C / 2-3	C / 2-3	C / 2-3	E / 1.5-2	C / 2-3	E / 1.5-2	C / 2-3	C / 2-3	E / 1.5-2		
E / O / P	E / O	E / O / P	E / O / P	E / O	E / O	E / O	E / O	E / O		
max. 3 x d <sub>1</sub> 		max. 3 x d <sub>1</sub> 		max. 3 x d <sub>1</sub> 		max. 3 x d <sub>1</sub> 			Thread Depth and Hole Type	
		153 159	153 159	153 159			154 160	154 160	UNC UNF	
165	165	166		166 169	166 169	163 169	166	166	UNEF, UN-8 M MF NPSM/NPSC NPSF	
									Rp (BSPP) G NPT NPTF Rc (BSPT) STI SELF-LOCK	
66 - 262	66 - 262	<b>66 - 262</b>	<b>66 - 262</b>	<b>66 - 262</b>	<b>66 - 262</b>				1.1	
66 - 197	66 - 197	<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>	<b>66 - 197</b>	33 - 131	66 - 197	66 - 197	2.1	
<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	<b>33 - 131</b>	16 - 82	<b>33 - 131</b>	<b>33 - 131</b>	3.1	
<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>	<b>33 - 98</b>	16 - 66	<b>33 - 98</b>	<b>33 - 98</b>	4.1	
<b>16 - 66</b>	<b>16 - 66</b>						16 - 66	16 - 66	5.1	
		33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>				1.1	
		33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>	33 - 82 <sup>2)</sup>				2.1	
		16 - 66 <sup>2)</sup>	16 - 66 <sup>2)</sup>	16 - 66 <sup>2)</sup>	16 - 66 <sup>2)</sup>				3.1	
									4.1	
<b>66 - 197</b>	<b>66 - 197</b>	66 - 197	66 - 197	66 - 197	66 - 197				1.1	
									1.2	
									2.1	
									2.2	
									3.1	
									3.2	
									4.1	
									4.2	
									1.1	
									1.2	
									1.3	
						49 - 131	<b>66 - 197</b>	<b>66 - 197</b>	1.4	
						49 - 131	<b>66 - 197</b>	<b>66 - 197</b>	1.5	
							66 - 131	66 - 131	1.6	
		<b>66 - 131</b>	<b>66 - 131</b>	<b>66 - 131</b>	<b>66 - 131</b>				2.1	
		<b>131 - 262</b>	<b>131 - 262</b>	<b>131 - 262</b>	<b>131 - 262</b>				2.2	
									2.3	
		66 - 131	66 - 131	66 - 131	66 - 131		66 - 131	66 - 131	2.4	
		<b>66 - 131</b>	<b>66 - 131</b>	<b>66 - 131</b>	<b>66 - 131</b>		<b>66 - 131</b>	<b>66 - 131</b>	2.5	
									2.6	
									2.7	
									2.8	
									3.1	
									3.2	
									4.1	
									4.2	
									4.3	
									4.4	
									5.1	
									5.2	
									5.3	
		16 - 66	16 - 66	16 - 66	16 - 66				1.1	
		16 - 49	16 - 49	16 - 49	16 - 49				1.2	
		16 - 33	16 - 33	16 - 33	16 - 33				1.3	
									2.1	
		16 - 49	16 - 49	16 - 49	16 - 49				2.2	
		16 - 33	16 - 33	16 - 33	16 - 33				2.3	
									2.4	
		16 - 33	16 - 33	16 - 33	16 - 33				2.5	
									2.6	
									1.1	
									1.2	
									1.3	
									1.4	
									1.5	

Product  
Finder

V<sub>c</sub>

UNC

UNF

M

MF

SELF-LOCK

Accessories

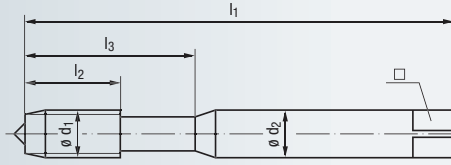
Tech. Info



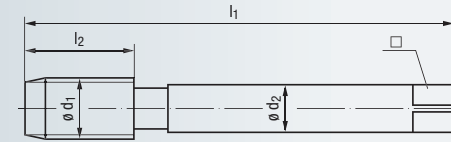
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

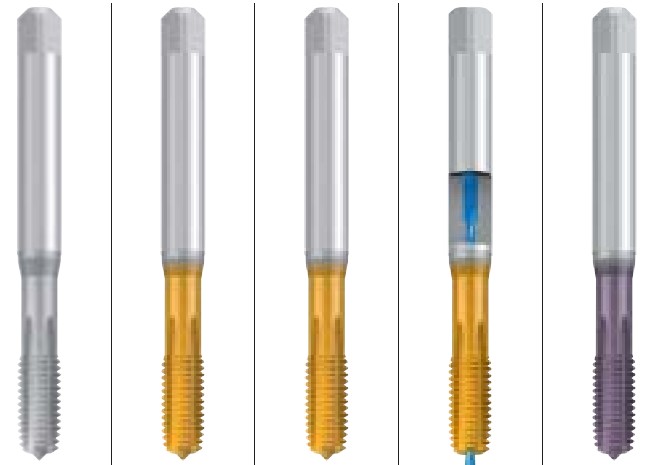
Overall length acc. to DIN 2174



Reinforced Shank  
(No. 1 - 3/8)



Reduced Shank  
(7/16 - 1)



**STEEL**  
Steel materials



**UNC**  
Unified coarse thread  
ASME B1.1

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

Range of Application

2BX	2BX	2BX	2BX	2BX
NT	TIN	TIN	TIN	TICN
C/2-3	C/2-3	<b>E / 1.5-2</b>	C/2-3	<b>E / 1.5-2</b>
O/P	E/O/P	E/O/P	E/O	E/O/P
	max. 3 x d <sub>1</sub>		max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>
			1)	
<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>

### Reinforced Shank

Reinforced Shank								Tool Identification		BU921000	BU921400	BU931400	BW921400	BU939000
Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	ø d <sub>2</sub>	□	Dimens. ID	Druck 1-STEEL-SN	Druck 1-STEEL-SN TIN	Druck 1-STEEL/E-SN TIN	Druck 1-STEEL-SN IKZ-TIN	Druck 1-STEEL/E-SN TICN		
No. 1	64	1.772	0.276	0.472	0.141	0.110	0.0670	.5000						
No. 2	56	1.772	0.276	0.472	0.141	0.110	0.0787	.5001	●		●	●		
No. 3	48	1.969	0.354	0.551	0.141	0.110	0.0906	.5002	●					
No. 4	40	2.205	0.433	0.709	0.141	0.110	0.1004	.5003	●	●	●	●		
No. 5	40	2.205	0.433	0.709	0.141	0.110	0.1142	.5004	●	●	●	●		
No. 6	32	2.205	0.472	0.787	0.141	0.110	0.1240	.5005	●	●	●	●		
No. 8	32	2.480	0.512	0.827	0.168	0.131	0.1496	.5006	●	●	●	●		
No. 10	24	2.756	0.591	0.984	0.194	0.152	0.1713	.5007	●	●	●	●		
No. 12	24	3.150	0.630	1.142	0.220	0.165	0.1969	.5008	●	●	●	●		
1/4	20	3.150	0.669	1.181	0.255	0.191	0.2264	.5009	●	●	●	●		
5/16	18	3.543	0.787	1.378	0.318	0.238	0.2874	.5010	●	●	●	●		
3/8	16	3.937	0.866	1.535	0.381	0.286	0.3465	.5011	●	●	●	●		

### Reduced Shank

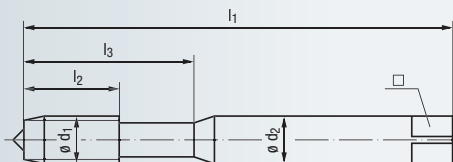
Reduced Shank								Tool Identification		CU921000	CU921400		
Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	ø d <sub>2</sub>	□	Dimens. ID	Druck 2-STEEL-SN	Druck 2-STEEL-SN TIN				
7/16	14	3.937	0.866	—	0.323	0.242	0.4035	.5012	●	●			
1/2	13	4.331	0.984	—	0.367	0.275	0.4646	.5013	●	●			
9/16	12	4.331	1.024	—	0.429	0.322	0.5236	.5014	●	●			
5/8	11	4.331	1.063	—	0.480	0.360	0.5827	.5015	●	●			
3/4	10	4.921	1.181	—	0.590	0.442	0.7028	.5016	●	●			
7/8	9	5.512	1.260	—	0.697	0.523	0.8228	.5017	●	●			
1	8	6.299	1.417	—	0.800	0.600	0.9409	.5018	●	●			



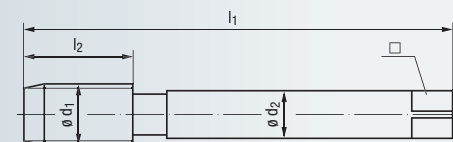
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- SELF-LOCK
- Accessories
- Tech. Info

**DIN Length - ANSI Shank**

Overall length acc. to DIN 2174



Reinforced Shank  
(No.1 - 3/8)



Reduced Shank  
(7/16 - 1)



**Z**  
CNC-controlled machines

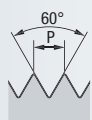


**Z**  
CNC-controlled machines



**Z**  
CNC-controlled machines

**UNC**



Unified coarse thread  
ASME B1.1

Class of Fit  
Coating  
Technical Characteristics



Thread Depth and Hole Shape

Range of Application

2BX	2BX	2BX
TIN	TIN	TIN
C / 2-3	C / 2-3	C / 2-3
E / O / P	E / O	E / O
max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>
<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-3.1 2)</b>	<b>M 1.1-3.1 2)</b>	<b>M 1.1-3.1 2)</b>
<b>K 2.1</b>	<b>K 2.1</b>	<b>K 2.1</b>
<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>
<b>S 1.1-2.2 2)</b>	<b>S 1.1-2.2 2)</b>	<b>S 1.1-2.2 2)</b>
<b>S 2.4 2)</b>	<b>S 2.4 2)</b>	<b>S 2.4 2)</b>

**Reinforced Shank**

**Tool Identification**

Nominal Size ø d <sub>1</sub>	T.P.I.	inch		ø d <sub>2</sub>	□	Tool ID	Dimens. ID	Material			
		l <sub>1</sub>	l <sub>2</sub>					l <sub>3</sub>	BU92F000	BW92F000	BW10F000
No. 1	64	1.772	0.177	0.472	0.141	0.110	0.0670	.5000			
No. 2	56	1.772	0.177	0.472	0.141	0.110	0.0787	.5001			
No. 3	48	1.969	0.197	0.551	0.141	0.110	0.0906	.5002			
No. 4	40	2.205	0.236	0.709	0.141	0.110	0.1004	.5003	●		
No. 5	40	2.205	0.276	0.709	0.141	0.110	0.1142	.5004	●		
No. 6	32	2.205	0.276	0.787	0.141	0.110	0.1240	.5005	●		
No. 8	32	2.480	0.315	0.827	0.168	0.131	0.1496	.5006	●		
No. 10	24	2.756	0.394	0.984	0.194	0.152	0.1713	.5007	●	●	●
No. 12	24	3.150	0.394	1.142	0.220	0.165	0.1969	.5008			
1/4	20	3.150	0.512	1.181	0.255	0.191	0.2264	.5009	●	●	●
5/16	18	3.543	0.551	1.378	0.318	0.238	0.2874	.5010	●	●	●
3/8	16	3.937	0.630	1.535	0.381	0.286	0.3465	.5011	●	●	●

BU92F000	BW92F000	BW10F000
Druck 1-Z-SN TIN-T1	Druck 1-Z-SN-IKZ TIN-T1	Druck 1-Z-SN-IKZN TIN-T1

**Reduced Shank**

**Tool Identification**

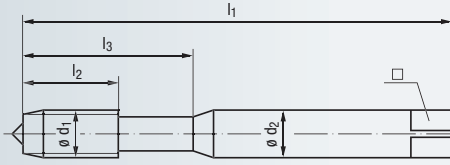
Nominal Size ø d <sub>1</sub>	T.P.I.	inch		ø d <sub>2</sub>	□	Tool ID	Dimens. ID	Material			
		l <sub>1</sub>	l <sub>2</sub>					l <sub>3</sub>	CU92F000	CW92F000	CW10F000
7/16	14	3.937	0.709	—	0.323	0.242	0.4035	.5012	●	●	●
1/2	13	4.331	0.787	—	0.367	0.275	0.4646	.5013	●	●	●
9/16	12	4.331	0.787	—	0.429	0.322	0.5236	.5014	●	●	●
5/8	11	4.331	0.866	—	0.480	0.360	0.5827	.5015	●	●	●
3/4	10	4.921	0.984	—	0.590	0.442	0.7028	.5016	●	●	●
7/8	9	5.512	1.063	—	0.697	0.523	0.8228	.5017			
1	8	6.299	1.181	—	0.800	0.600	0.9409	.5018			

CU92F000	CW92F000	CW10F000
Druck 2-Z-SN TIN-T1	Druck 2-Z-SN-IKZ TIN-T1	Druck 2-Z-SN-IKZN TIN-T1

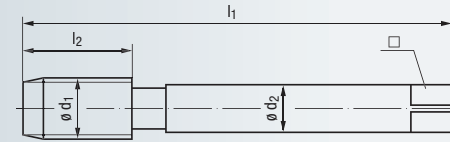
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

Overall length acc. to DIN 2174



Reinforced Shank  
(No. 1 - 3/8)



Reduced Shank  
(7/16 - 1)



**STEEL** Steel materials | **STEEL** Steel materials | **VA** Stainless steel materials | **VA** Stainless steel materials | **AL** Aluminum wrought alloys

# UNC

**Unified coarse thread  
ASME B1.1**

Class of Fit  
Coating  
Technical Characteristics

Thread Depth and Hole Shape

Range of Application

Class of Fit	2BX	2BX	2BX	2BX	2BX
Coating	TIN	TIN	GLT-7	GLT-7	GLT-8
Technical Characteristics	C/2-3	C/2-3	C/2-3	C/2-3	C/2-3
	E/O/P	E/O	E/O/P	E/O	E/O/P
Thread Depth and Hole Shape	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>
Range of Application	P 1.1-4.1 K 2.1	P 1.1-4.1 K 2.1	P 1.1-4.1 M 1.1-3.1 2)	P 1.1-4.1 M 1.1-3.1 2)	N 1.1-4, 2.1-2

### Reinforced Shank


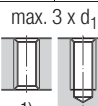
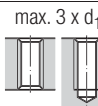
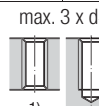
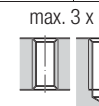
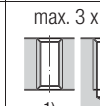


Nominal Size Ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch		□	Tool Identification		BU37P300	BU38P300	BU37N000	BU38N000	BU37S800
				l <sub>3</sub>	Ø d <sub>2</sub>		Dimens. ID	InnoForm 1-STEEL-SN TIN	InnoForm 1-STEEL-SN IKZ-TIN	InnoForm 1-VA-SN GLT-7	InnoForm 1-VA-SN-IKZ GLT-7	InnoForm 1-AL-SN GLT-8	
No. 1	64	1.772	0.177	0.472	0.141	0.110	0.0670	.5000					
No. 2	56	1.772	0.177	0.472	0.141	0.110	0.0787	.5001					
No. 3	48	1.969	0.197	0.551	0.141	0.110	0.0906	.5002					
No. 4	40	2.205	0.236	0.709	0.141	0.110	0.1004	.5003	●		●		●
No. 5	40	2.205	0.276	0.709	0.141	0.110	0.1142	.5004					
No. 6	32	2.205	0.276	0.787	0.141	0.110	0.1240	.5005	●		●		●
No. 8	32	2.480	0.315	0.827	0.168	0.131	0.1496	.5006	●		●		●
No. 10	24	2.756	0.394	0.984	0.194	0.152	0.1713	.5007	●	●	●	●	●
No. 12	24	3.150	0.394	1.142	0.220	0.165	0.1969	.5008					
1/4	20	3.150	0.512	1.181	0.255	0.191	0.2264	.5009	●	●	●	●	●
5/16	18	3.543	0.551	1.378	0.318	0.238	0.2874	.5010	●	●	●	●	●
3/8	16	3.937	0.630	1.535	0.381	0.286	0.3465	.5011	●	●	●	●	●

### Reduced Shank

Nominal Size Ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch		□	Tool Identification		CU37P300	CU38P300	CU37N000	CU38N000	CU37S800
				l <sub>3</sub>	Ø d <sub>2</sub>		Dimens. ID	InnoForm 2-STEEL-SN TIN	InnoForm 2-STEEL-SN IKZ-TIN	InnoForm 2-VA-SN GLT-7	InnoForm 2-VA-SN-IKZ GLT-7	InnoForm 2-AL-SN GLT-8	
7/16	14	3.937	0.709	—	0.323	0.242	0.4035	.5012	●	●	●	●	●
1/2	13	4.331	0.787	—	0.367	0.275	0.4646	.5013	●	●	●	●	●
9/16	12	4.331	0.787	—	0.429	0.322	0.5236	.5014					
5/8	11	4.331	0.866	—	0.480	0.360	0.5827	.5015					
3/4	10	4.921	0.984	—	0.590	0.442	0.7028	.5016					
7/8	9	5.512	1.063	—	0.697	0.523	0.8228	.5017					
1	8	6.299	1.181	—	0.800	0.600	0.9409	.5018					

1) Cold-forming in through holes is possible only with external cooling/lubrication  
2) Restricted application possibilities with emulsion

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- SELF-LOCK
- Accessories
- Tech. Info

AL Aluminum wrought alloys		AL Aluminum wrought alloys		GAL Aluminum cast alloys		GAL Aluminum cast alloys		GAL Aluminum cast alloys		Z CNC-controlled machines		Z CNC-controlled machines		Z CNC-controlled machines		Class of Fit Coating Technical Characteristics 
2BX	GLT-8	2BX	GLT-8	2BX	TICN	2BX	TICN	2BX	TICN	2BX	TIN-T1	2BX	TIN-T1	2BX	TIN-T1	
C/2-3	E/O	E/1.5-2	E/O	C/2-3	E/O/P	C/2-3	E/O	E/1.5-2	E/O	C/2-3	E/O/P	E/1.5-2	E/O/P	C/2-3	E/O	
														Thread Depth and Hole Shape		
N 1.1-4, 2.1-2		N 1.1-4, 2.1-2		N 1.4-6		N 1.4-6		N 1.4-6		P 1.1-4.1 M 1.1-3.1 2) K 2.1 N 2.1-2, 2.4-5 S 1.1-2.2 2) S 2.4 2)		P 1.1-4.1 M 1.1-3.1 2) K 2.1 N 2.1-2, 2.4-5 S 1.1-2.2 2) S 2.4 2)		P 1.1-4.1 M 1.1-3.1 2) K 2.1 N 2.1-2, 2.4-5 S 1.1-2.2 2) S 2.4 2)		Range of Application
BU38S800	BU44S800	BU37Q200	BU38Q200	BU44Q200	BU37A800	BU39A800	BU38A800	Tool Identification			Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.			
InnoForm 1-AL-SN-IKZ GLT-8	InnoForm 1-AL/E-SN IKZ-GLT-8	InnoForm 1-GAL-SN TICN	InnoForm 1-GAL-SN IKZ-TICN	InnoForm 1-GAL/E-SN IKZ-TICN	InnoForm 1-Z-SN TIN-T1	InnoForm 1-Z/E-SN TIN-T1	InnoForm 1-Z-SN-IKZ TIN-T1									
											.5000	No. 1	64			
											.5001	No. 2	56			
											.5002	No. 3	48			
		•				•	•				.5003	No. 4	40			
		•				•	•				.5004	No. 5	40			
		•				•	•				.5005	No. 6	32			
		•				•	•				.5006	No. 8	32			
•	•	•	•	•	•	•	•	•			.5007	No. 10	24			
											.5008	No. 12	24			
•	•	•	•	•	•	•	•	•			.5009	1/4	20			
•	•	•	•	•	•	•	•	•			.5010	5/16	18			
•	•	•	•	•	•	•	•	•			.5011	3/8	16			
CU38S800	CU44S800	CU37Q200	CU38Q200	CU44Q200	CU37A800	CU39A800	CU38A800	Tool Identification			Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.			
InnoForm 2-AL-SN-IKZ GLT-8	InnoForm 2-AL/E-SN IKZ-GLT-8	InnoForm 2-GAL-SN TICN	InnoForm 2-GAL-SN IKZ-TICN	InnoForm 2-GAL/E-SN IKZ-TICN	InnoForm 2-Z-SN TIN-T1	InnoForm 2-Z/E-SN TIN-T1	InnoForm 2-Z-SN-IKZ TIN-T1									
•	•	•	•	•	•	•	•				.5012	7/16	14			
•	•	•	•	•	•	•	•				.5013	1/2	13			
											.5014	9/16	12			
											.5015	5/8	11			
											.5016	3/4	10			
											.5017	7/8	9			
											.5018	1	8			

• = In stock

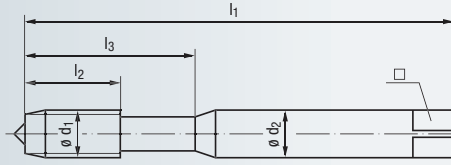
1) Cold-forming in through holes is possible only with external cooling/lubrication  
2) Restricted application possibilities with emulsion



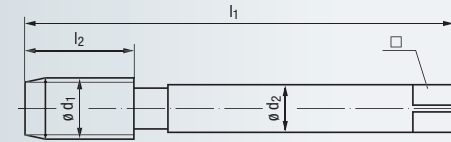
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

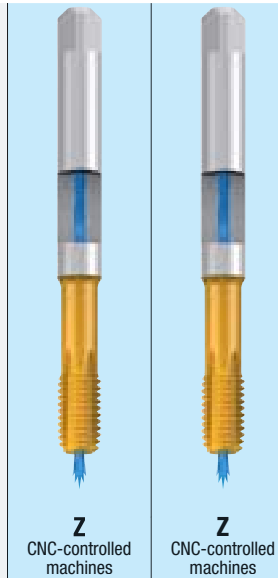
Overall length acc. to DIN 2174



Reinforced Shank  
(No.1 - 3/8)



Reduced Shank  
(7/16 - 1)



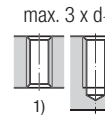
# UNC

**Unified coarse thread  
ASME B1.1**

Class of Fit  
Coating  
Technical Characteristics

2BX	2BX
TIN-T1	TIN-T1
<b>Carbide</b>	<b>Carbide</b>
C / 2-3	<b>E / 1.5-2</b>
E / 0	E / 0

Thread Depth and Hole Shape



Range of Application

<b>P 2.1-5.1</b>	<b>P 2.1-5.1</b>
<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-6, 2.4-5</b>

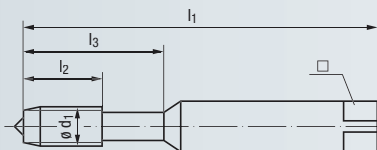
### Reinforced Shank

Nominal Size							Tool Identification		BU38P900	BU44P900			
Ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	Ø d <sub>2</sub>	□	Dimens. ID	VHM InnoForm 1-Z-SN-IKZ TIN-T1	VHM InnoForm 1-Z/E-SN-IKZ TIN-T1				
No. 1	64	1.772	0.177	0.472	0.141	0.110	0.0670	.5000					
No. 2	56	1.772	0.177	0.472	0.141	0.110	0.0787	.5001					
No. 3	48	1.969	0.197	0.551	0.141	0.110	0.0906	.5002					
No. 4	40	2.205	0.236	0.709	0.141	0.110	0.1004	.5003					
No. 5	40	2.205	0.276	0.709	0.141	0.110	0.1142	.5004					
No. 6	32	2.205	0.276	0.787	0.141	0.110	0.1240	.5005					
No. 8	32	2.480	0.315	0.827	0.168	0.131	0.1496	.5006					
No. 10	24	2.756	0.394	0.984	0.194	0.152	0.1713	.5007	●	●			
No. 12	24	3.150	0.394	1.142	0.220	0.165	0.1969	.5008					
1/4	20	3.150	0.512	1.181	0.255	0.191	0.2264	.5009	●	●			
5/16	18	3.543	0.551	1.378	0.318	0.238	0.2874	.5010	●	●			
3/8	16	3.937	0.630	1.535	0.381	0.286	0.3465	.5011	●	●			

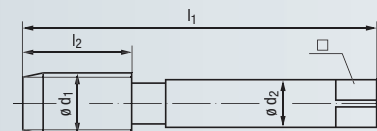
### Reduced Shank

Nominal Size							Tool Identification		CU38P900	CU44P900			
Ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	Ø d <sub>2</sub>	□	Dimens. ID	VHM InnoForm 2-Z-SN-IKZ TIN-T1	VHM InnoForm 2-Z/E-SN-IKZ TIN-T1				
7/16	14	3.937	0.709	—	0.323	0.242	0.4035	.5012	●	●			
1/2	13	4.331	0.787	—	0.367	0.275	0.4646	.5013	●	●			
9/16	12	4.331	0.787	—	0.429	0.322	0.5236	.5014					
5/8	11	4.331	0.866	—	0.480	0.360	0.5827	.5015					
3/4	10	4.921	0.984	—	0.590	0.442	0.7028	.5016					
7/8	9	5.512	1.063	—	0.697	0.523	0.8228	.5017					
1	8	6.299	1.181	—	0.800	0.600	0.9409	.5018					

**ANSI Length • ANSI Shank**



Reinforced Shank  
(No.4 - 3/8)

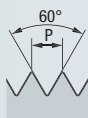


Reduced Shank  
(7/16 - 3/4)



**STEEL**  
Steel materials

**UNC**



Unified coarse thread  
ASME B1.1

Class of Fit: 2BX  
Coating: TIN  
Technical Characteristics: C/2-3, E/O/P

Thread Depth and Hole Shape: max. 3 x d<sub>1</sub>

Range of Application: P 1.1-3.1, M 1.1-2.1<sup>2)</sup>, N 1.4-5, 2.1-2

**Tool Identification**

**AU921400**

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>		inch				□	Dimens. ID	Druck STEEL-SN TIN
		l <sub>2</sub>	l <sub>3</sub>	l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	□			
No. 4	40	1 7/8	1.88	0.433	0.709	0.141	0.110	0.1004	.5003	●
No. 5	40	1 15/16	1.94	0.433	0.709	0.141	0.110	0.1142	.5004	●
No. 6	32	2	2.00	0.472	0.748	0.141	0.110	0.1240	.5005	●
No. 8	32	2 1/8	2.13	0.512	0.827	0.168	0.131	0.1496	.5006	●
No. 10	24	2 3/8	2.38	0.591	0.945	0.194	0.152	0.1713	.5007	●
1/4	20	2 1/2	2.50	0.669	1.142	0.255	0.191	0.2264	.5009	●
5/16	18	2 23/32	2.72	0.787	1.299	0.318	0.238	0.2874	.5010	●
3/8	16	2 15/16	2.94	0.866	1.378	0.381	0.286	0.3465	.5011	●
7/16	14	3 5/32	3.16	0.866	—	0.323	0.242	0.4035	.5012	●
1/2	13	3 3/8	3.38	0.984	—	0.367	0.275	0.4646	.5013	●
9/16	12	3 19/32	3.59	1.024	—	0.429	0.322	0.5236	.5014	●
5/8	11	3 13/16	3.81	1.063	—	0.480	0.360	0.5827	.5015	●
3/4	10	4 1/4	4.25	1.181	—	0.590	0.442	0.7028	.5016	●

2) Restricted application possibilities with emulsion

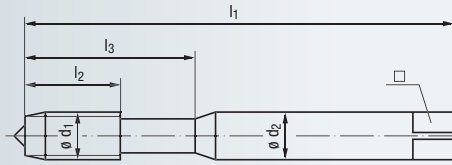
- Product Finder
- V<sub>c</sub>
- UNC**
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info



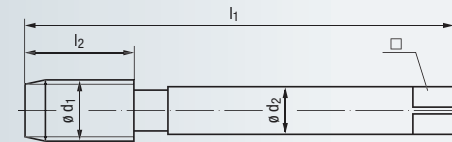
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

Overall length acc. to DIN 2174



Reinforced Shank  
(No.0 - 3/8)



Reduced Shank  
(7/16 - 7/8)



**STEEL**  
Steel materials



**Unified fine thread  
ASME B1.1**

Class of Fit  
Coating  
Technical Characteristics

Thread Depth  
and Hole Shape

Range of Application

2BX	2BX	2BX	2BX	2BX
NT	TIN	TIN	TIN	TICN
C/2-3	C/2-3	<b>E / 1.5-2</b>	C/2-3	<b>E / 1.5-2</b>
O/P	E/O/P	E/O/P	E/O	E/O/P
	max. 3 x d <sub>1</sub>		max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>
	<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification	BU921000				
				l <sub>3</sub>	ø d <sub>2</sub>	□			Dimens. ID	Druck 1-STEEL-SN	Druck 1-STEEL-SN TIN	Druck 1-STEEL/E-SN TIN	Druck 1-STEEL-SN IKZ-TIN
No. 0	80	1.626	0.236	0.433	0.141	0.110	0.0551	.5033	●				
No. 1	72	1.772	0.276	0.472	0.141	0.110	0.0669	.5034	●				
No. 2	64	1.772	0.276	0.472	0.141	0.110	0.0795	.5035	●				
No. 3	56	1.969	0.354	0.551	0.141	0.110	0.0913	.5036	●				
No. 4	48	2.205	0.433	0.709	0.141	0.110	0.1031	.5037	●	●			
No. 5	44	2.205	0.433	0.709	0.141	0.110	0.1150	.5038	●	●			
No. 6	40	2.205	0.472	0.787	0.141	0.110	0.1268	.5039	●	●			
No. 8	36	2.480	0.512	0.827	0.168	0.131	0.1516	.5040	●	●			
No. 10	32	2.756	0.512	0.984	0.194	0.152	0.1752	.5041	●	●	●		●
No. 12	28	3.150	0.630	1.142	0.220	0.165	0.2008	.5042	●	●	●		●
1/4	28	3.150	0.669	1.181	0.255	0.191	0.2343	.5043	●	●	●	●	●
5/16	24	3.543	0.669	1.260	0.318	0.238	0.2933	.5044	●	●	●	●	●
3/8	24	3.937	0.709	1.535	0.381	0.286	0.3563	.5045	●	●	●	●	●

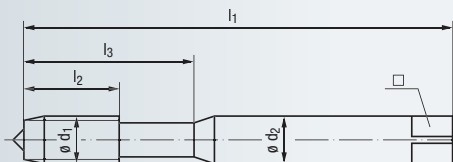
### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□	Tool Identification	CU921000					
				l <sub>3</sub>	ø d <sub>2</sub>	□			Dimens. ID	Druck 2-STEEL-SN	Druck 2-STEEL-SN TIN			
7/16	20	3.937	0.866	—	0.323	0.242	0.4154	.5046	●	●				
1/2	20	3.937	0.866	—	0.367	0.275	0.4783	.5047	●	●				
9/16	18	3.937	0.866	—	0.429	0.322	0.5374	.5048	●	●				
5/8	18	3.937	0.866	—	0.480	0.360	0.6004	.5049	●	●				
3/4	16	4.331	0.984	—	0.590	0.442	0.7224	.5050	●	●				
7/8	14	4.921	1.024	—	0.697	0.523	0.8425	.5051	●	●				

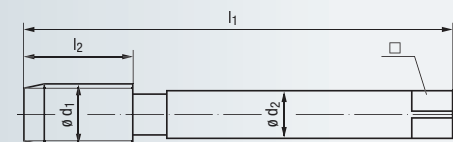
- Product Finder
- V<sub>c</sub>
- UNC
- UNF**
- M
- MF
- SELF-LOCK
- Accessories
- Tech. Info

**DIN Length · ANSI Shank**

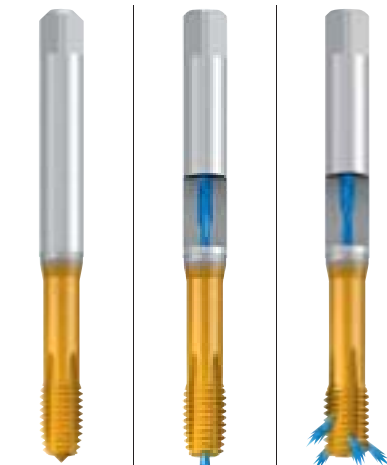
Overall length acc. to DIN 2174



Reinforced Shank  
(No.0 - 3/8)

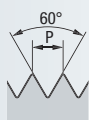


Reduced Shank  
(7/16 - 7/8)



**Z** CNC-controlled machines  
**Z** CNC-controlled machines  
**Z** CNC-controlled machines

**UNF**



Unified fine thread  
ASME B1.1

Class of Fit  
Coating  
Technical Characteristics



Thread Depth and Hole Shape

Range of Application

2BX	2BX	2BX
TIN	TIN	TIN
C / 2-3	C / 2-3	C / 2-3
E / O / P	E / O	E / O
max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>
<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>
<b>M 1.1-3.1 2)</b>	<b>M 1.1-3.1 2)</b>	<b>M 1.1-3.1 2)</b>
<b>K 2.1</b>	<b>K 2.1</b>	<b>K 2.1</b>
<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>	<b>N 2.1-2, 2.4-5</b>
<b>S 1.1-2.2 2)</b>	<b>S 1.1-2.2 2)</b>	<b>S 1.1-2.2 2)</b>
<b>S 2.4 2)</b>	<b>S 2.4 2)</b>	<b>S 2.4 2)</b>

**Reinforced Shank**

**Tool Identification**

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□		Dimens. ID	BU92F000	BW92F000	BW10F000
				l <sub>3</sub>	ø d <sub>2</sub>	□						
No. 0	80	1.626	0.157	0.433	0.141	0.110	0.0551	<b>.5033</b>				
No. 1	72	1.772	0.157	0.472	0.141	0.110	0.0669	<b>.5034</b>				
No. 2	64	1.772	0.177	0.472	0.141	0.110	0.0795	<b>.5035</b>				
No. 3	56	1.969	0.197	0.551	0.141	0.110	0.0913	<b>.5036</b>				
No. 4	48	2.205	0.236	0.709	0.141	0.110	0.1031	<b>.5037</b>				
No. 5	44	2.205	0.276	0.709	0.141	0.110	0.1150	<b>.5038</b>				
No. 6	40	2.205	0.276	0.787	0.141	0.110	0.1268	<b>.5039</b>				
No. 8	36	2.480	0.315	0.827	0.168	0.131	0.1516	<b>.5040</b>				
No. 10	32	2.756	0.394	0.984	0.194	0.152	0.1752	<b>.5041</b>	●	●	●	
No. 12	28	3.150	0.394	1.142	0.220	0.165	0.2008	<b>.5042</b>				
1/4	28	3.150	0.394	1.181	0.255	0.191	0.2343	<b>.5043</b>	●	●	●	
5/16	24	3.543	0.394	1.260	0.318	0.238	0.2933	<b>.5044</b>	●	●	●	
3/8	24	3.937	0.394	1.535	0.381	0.286	0.3563	<b>.5045</b>	●	●	●	

**Reduced Shank**

**Tool Identification**

Nominal Size ø d <sub>1</sub>	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			□		Dimens. ID	CU92F000	CW92F000	CW10F000
				l <sub>3</sub>	ø d <sub>2</sub>	□						
7/16	20	3.937	0.512	—	0.323	0.242	0.4154	<b>.5046</b>	●	●	●	
1/2	20	3.937	0.512	—	0.367	0.275	0.4783	<b>.5047</b>	●	●	●	
9/16	18	3.937	0.591	—	0.429	0.322	0.5374	<b>.5048</b>	●	●	●	
5/8	18	3.937	0.591	—	0.480	0.360	0.6004	<b>.5049</b>	●	●	●	
3/4	16	4.331	0.669	—	0.590	0.442	0.7224	<b>.5050</b>	●	●	●	
7/8	14	4.921	0.669	—	0.697	0.523	0.8425	<b>.5051</b>				

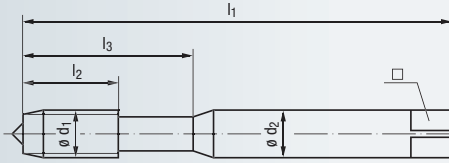
● = In stock

1) Cold-forming in through holes is possible only with external cooling/lubrication

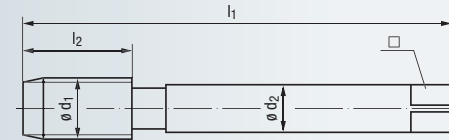
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

Overall length acc. to DIN 2174



Reinforced Shank  
(No.0 - 3/8)



Reduced Shank  
(7/16 - 7/8)



<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	<b>VA</b> Stainless steel materials	<b>VA</b> Stainless steel materials	<b>AL</b> Aluminum wrought alloys
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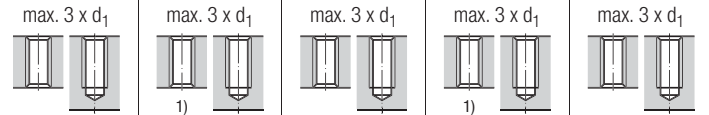
# UNF

**Unified fine thread  
ASME B1.1**

Class of Fit  
Coating  
Technical Characteristics

2BX	2BX	2BX	2BX	2BX
TIN	TIN	GLT-7	GLT-7	GLT-8
C/2-3	C/2-3	C/2-3	C/2-3	C/2-3
E/O/P	E/O	E/O/P	E/O	E/O/P

Thread Depth and Hole Shape



Range of Application

<b>P 1.1-4.1</b> <b>K 2.1</b>	<b>P 1.1-4.1</b> <b>K 2.1</b>	<b>P 1.1-4.1</b> <b>M 1.1-3.1 2)</b>	<b>P 1.1-4.1</b> <b>M 1.1-3.1 2)</b>	<b>N 1.1-4,2.1-2</b>
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### Reinforced Shank


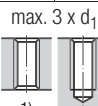
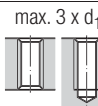
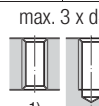


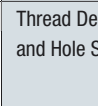

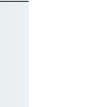
Nominal Size $\phi d_1$	T.P.I.	$l_1$	$l_2$	inch			$\phi d_2$	$\square$	Tool Identification		BU37P300	BU38P300	BU37N000	BU38N000	BU37S800
				$l_3$	$\phi d_2$	$\square$			Dimens. ID	InnoForm 1-STEEL-SN TIN	InnoForm 1-STEEL-SN IKZ-TIN	InnoForm 1-VA-SN GLT-7	InnoForm 1-VA-SN-IKZ GLT-7	InnoForm 1-AL-SN GLT-8	
No. 0	80	1.626	0.157	0.433	0.141	0.110	0.0551	.5033							
No. 1	72	1.772	0.157	0.472	0.141	0.110	0.0669	.5034							
No. 2	64	1.772	0.177	0.472	0.141	0.110	0.0795	.5035							
No. 3	56	1.969	0.197	0.551	0.141	0.110	0.0913	.5036							
No. 4	48	2.205	0.236	0.709	0.141	0.110	0.1031	.5037							
No. 5	44	2.205	0.276	0.709	0.141	0.110	0.1150	.5038							
No. 6	40	2.205	0.276	0.787	0.141	0.110	0.1268	.5039							
No. 8	36	2.480	0.315	0.827	0.168	0.131	0.1516	.5040							
No. 10	32	2.756	0.394	0.984	0.194	0.152	0.1752	.5041	•	•	•	•	•	•	•
No. 12	28	3.150	0.394	1.142	0.220	0.165	0.2008	.5042							
1/4	28	3.150	0.394	1.181	0.255	0.191	0.2343	.5043	•	•	•	•	•	•	•
5/16	24	3.543	0.394	1.260	0.318	0.238	0.2933	.5044	•	•	•	•	•	•	•
3/8	24	3.937	0.394	1.535	0.381	0.286	0.3563	.5045	•	•	•	•	•	•	•

### Reduced Shank

Nominal Size $\phi d_1$	T.P.I.	$l_1$	$l_2$	inch			$\phi d_2$	$\square$	Tool Identification		CU37P300	CU38P300	CU37N000	CU38N000	CU37S800
				$l_3$	$\phi d_2$	$\square$			Dimens. ID	InnoForm 2-STEEL-SN TIN	InnoForm 2-STEEL-SN IKZ-TIN	InnoForm 2-VA-SN GLT-7	InnoForm 2-VA-SN-IKZ GLT-7	InnoForm 2-AL-SN GLT-8	
7/16	20	3.937	0.512	—	0.323	0.242	0.4154	.5046	•	•	•	•	•	•	•
1/2	20	3.937	0.512	—	0.367	0.275	0.4783	.5047	•	•	•	•	•	•	•
9/16	18	3.937	0.591	—	0.429	0.322	0.5374	.5048							
5/8	18	3.937	0.591	—	0.480	0.360	0.6004	.5049							
3/4	16	4.331	0.669	—	0.590	0.442	0.7224	.5050							
7/8	14	4.921	0.669	—	0.697	0.523	0.8425	.5051							



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- SELF-LOCK
- Accessories
- Tech. Info

AL Aluminum wrought alloys		AL Aluminum wrought alloys		GAL Aluminum cast alloys		GAL Aluminum cast alloys		GAL Aluminum cast alloys		Z CNC-controlled machines		Z CNC-controlled machines		Z CNC-controlled machines		Class of Fit Coating Technical Characteristics 
2BX	GLT-8	2BX	GLT-8	2BX	TICN	2BX	TICN	2BX	TICN	2BX	TIN-T1	2BX	TIN-T1	2BX	TIN-T1	
C / 2-3	E / 1.5-2	C / 2-3	E / 1.5-2	C / 2-3	E / 0 / P	C / 2-3	E / 0	C / 2-3	E / 1.5-2	C / 2-3	E / 0 / P	C / 2-3	E / 1.5-2	C / 2-3	E / 0	
E / 0	E / 0	E / 0 / P	E / 0	E / 0 / P	E / 0	E / 0	E / 0	E / 0 / P	E / 0 / P	E / 0 / P	E / 0 / P	E / 0 / P	E / 0 / P	E / 0	E / 0	
																Thread Depth and Hole Shape
max. 3 x d <sub>1</sub>		max. 3 x d <sub>1</sub>		max. 3 x d <sub>1</sub>		max. 3 x d <sub>1</sub>		max. 3 x d <sub>1</sub>		max. 3 x d <sub>1</sub>		max. 3 x d <sub>1</sub>		max. 3 x d <sub>1</sub>		Range of Application
N 1.1-4, 2.1-2		N 1.1-4, 2.1-2		N 1.4-6		N 1.4-6		N 1.4-6		P 1.1-4.1 M 1.1-3.1 2) K 2.1 N 2.1-2, 2.4-5 S 1.1-2.2 2) S 2.4 2)		P 1.1-4.1 M 1.1-3.1 2) K 2.1 N 2.1-2, 2.4-5 S 1.1-2.2 2) S 2.4 2)		P 1.1-4.1 M 1.1-3.1 2) K 2.1 N 2.1-2, 2.4-5 S 1.1-2.2 2) S 2.4 2)		Tool Identification
BU38S800	BU44S800	BU37Q200	BU38Q200	BU44Q200	BU37A800	BU39A800	BU38A800	Tool Identification			Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.			
InnoForm 1-AL-SN- IKZ-GLT-8	InnoForm 1-AL/E-SN IKZ-GLT-8	InnoForm 1-GAL-SN TICN	InnoForm 1-GAL-SN IKZ-TICN	InnoForm 1-GAL/E-SN IKZ-TICN	InnoForm 1-Z-SN TIN-T1	InnoForm 1-Z/E-SN TIN-T1	InnoForm 1-Z-SN- IKZ-TIN-T1				.5033	No. 0	80			
											.5034	No. 1	72			
											.5035	No. 2	64			
											.5036	No. 3	56			
											.5037	No. 4	48			
											.5038	No. 5	44			
											.5039	No. 6	40			
											.5040	No. 8	36			
											.5041	No. 10	32			
											.5042	No. 12	28			
											.5043	1/4	28			
											.5044	5/16	24			
											.5045	3/8	24			
CU38S800	CU44S800	CU37Q200	CU38Q200	CU44Q200	CU37A800	CU39A800	CU38A800	Tool Identification			Dimens. ID	Nominal Size ø d <sub>1</sub>	T.P.I.			
InnoForm 2-AL-SN- IKZ-GLT-8	InnoForm 2-AL/E-SN IKZ-GLT-8	InnoForm 2-GAL-SN TICN	InnoForm 2-GAL-SN IKZ-TICN	InnoForm 2-GAL/E-SN IKZ-TICN	InnoForm 2-Z-SN TIN-T1	InnoForm 2-Z/E-SN TIN-T1	InnoForm 2-Z-SN- IKZ-TIN-T1				.5046	7/16	20			
											.5047	1/2	20			
											.5048	9/16	18			
											.5049	5/8	18			
											.5050	3/4	16			
											.5051	7/8	14			



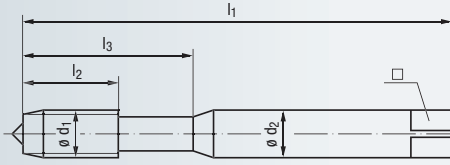
● = In stock

1) Cold-forming in through holes is possible only with external cooling/lubrication  
2) Restricted application possibilities with emulsion

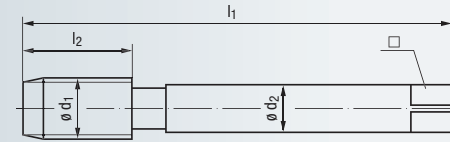
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · ANSI Shank

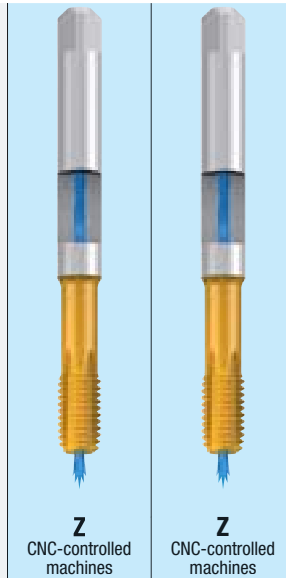
Overall length acc. to DIN 2174



Reinforced Shank  
(No.0 - 3/8)



Reduced Shank  
(7/16 - 7/8)



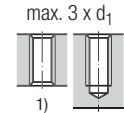
# UNF

**Unified fine thread  
ASME B1.1**

Class of Fit  
Coating  
Technical Characteristics

2BX	2BX
TIN-T1	TIN-T1
<b>Carbide</b>	<b>Carbide</b>
C / 2-3	<b>E / 1.5-2</b>
E / 0	E / 0

Thread Depth and Hole Shape



Range of Application

<b>P 2.1-5.1</b>	<b>P 2.1-5.1</b>
<b>N 1.4-6, 2.4-5</b>	<b>N 1.4-6, 2.4-5</b>

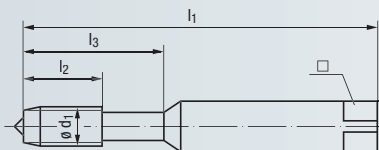
### Reinforced Shank

Reinforced Shank								Tool Identification		BU38P900	BU44P900				
Nominal Size $\phi d_1$	T.P.I.	$l_1$	$l_2$	inch		$\phi d_2$	$\square$		Dimens. ID	VHM InnoForm 1-Z-SN-IKZ TIN-T1	VHM InnoForm 1-Z/E-SN-IKZ TIN-T1				
No. 0	80	1.626	0.157	0.433	0.141	0.110		0.0551	.5033						
No. 1	72	1.772	0.157	0.472	0.141	0.110		0.0669	.5034						
No. 2	64	1.772	0.177	0.472	0.141	0.110		0.0795	.5035						
No. 3	56	1.969	0.197	0.551	0.141	0.110		0.0913	.5036						
No. 4	48	2.205	0.236	0.709	0.141	0.110		0.1031	.5037						
No. 5	44	2.205	0.276	0.709	0.141	0.110		0.1150	.5038						
No. 6	40	2.205	0.276	0.787	0.141	0.110		0.1268	.5039						
No. 8	36	2.480	0.315	0.827	0.168	0.131		0.1516	.5040						
No. 10	32	2.756	0.394	0.984	0.194	0.152		0.1752	.5041	•	•				
No. 12	28	3.150	0.394	1.142	0.220	0.165		0.2008	.5042						
1/4	28	3.150	0.394	1.181	0.255	0.191		0.2343	.5043	•	•				
5/16	24	3.543	0.394	1.260	0.318	0.238		0.2933	.5044	•	•				
3/8	24	3.937	0.394	1.535	0.381	0.286		0.3563	.5045	•	•				

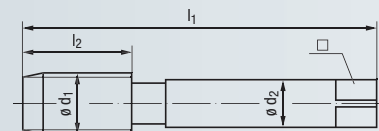
### Reduced Shank

Reduced Shank								Tool Identification		CU38P900	CU44P900				
Nominal Size $\phi d_1$	T.P.I.	$l_1$	$l_2$	inch		$\phi d_2$	$\square$		Dimens. ID	VHM InnoForm 2-Z-SN-IKZ TIN-T1	VHM InnoForm 2-Z/E-SN-IKZ TIN-T1				
7/16	20	3.937	0.512	—	0.323	0.242		0.4154	.5046	•	•				
1/2	20	3.937	0.512	—	0.367	0.275		0.4783	.5047	•	•				
9/16	18	3.937	0.591	—	0.429	0.322		0.5374	.5048						
5/8	18	3.937	0.591	—	0.480	0.360		0.6004	.5049						
3/4	16	4.331	0.669	—	0.590	0.442		0.7224	.5050						
7/8	14	4.921	0.669	—	0.697	0.523		0.8425	.5051						

**ANSI Length • ANSI Shank**



Reinforced Shank  
(No.6 - 3/8)

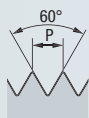


Reduced Shank  
(7/16 - 3/4)



**STEEL**  
Steel materials

**UNF**



Unified fine thread  
ASME B1.1

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape

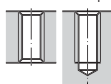
2BX

TIN

C / 2-3

E / O / P

max. 3 x  $d_1$



Range of Application

P 1.1-3.1

M 1.1-2.1 2)

N 1.4-5, 2.1-2

**Tool Identification**

AU921400

Druck  
STEEL-SN  
TIN

Nominal Size $\varnothing d_1$	T.P.I.	inch						Tool ID	Dimens. ID	Druck STEEL-SN TIN
		$l_1$	$l_2$	$l_3$	$\varnothing d_2$	$\square$	$\varnothing d_1$			
No. 6	40	2	2.00	0.472	0.748	0.141	0.110	0.1268	.5039	●
No. 8	36	2 1/8	2.13	0.512	0.827	0.168	0.131	0.1516	.5040	●
No. 10	32	2 3/8	2.38	0.591	0.945	0.194	0.152	0.1752	.5041	●
1/4	28	2 1/2	2.50	0.669	1.142	0.255	0.191	0.2343	.5043	●
5/16	24	2 23/32	2.72	0.669	1.299	0.318	0.238	0.2933	.5044	●
3/8	24	2 15/16	2.94	0.709	1.378	0.381	0.286	0.3563	.5045	●
7/16	20	3 5/32	3.16	0.866	—	0.323	0.242	0.4154	.5046	●
1/2	20	3 3/8	3.38	0.866	—	0.367	0.275	0.4783	.5047	●
9/16	18	3 19/32	3.59	0.866	—	0.429	0.322	0.5374	.5048	●
5/8	18	3 13/16	3.81	0.866	—	0.480	0.360	0.6004	.5049	●
3/4	16	4 1/4	4.25	0.984	—	0.590	0.442	0.7224	.5050	●

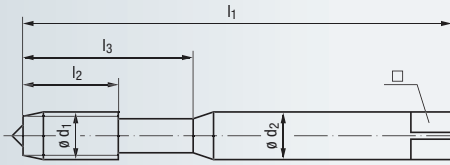
2) Restricted application possibilities with emulsion

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

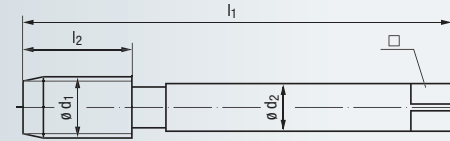


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M**
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank



Reinforced Shank  
(M2 - M10)



Reduced Shank  
(M12 - M20)



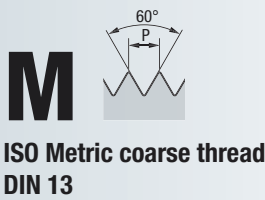
**STEEL**  
Steel materials

**STEEL**  
Steel materials

**STEEL**  
Steel materials

**STEEL**  
Steel materials

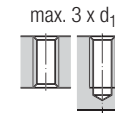
**STEEL**  
Steel materials



Class of Fit  
Coating  
Technical Characteristics

6HX	<b>6GX</b>	6HX	6HX	6HX
NT	NT	NT	CR	TIN
C/2-3	C/2-3	C/2-3	C/2-3	C/2-3
O/P	O/P	O/P	E/O	E/O/P

Thread Depth  
and Hole Shape



Range of Application

P 1.1-3.1	P 1.1-3.1	P 1.1-3.1	N 1.1-4, 2.1-2	P 1.1-3.1 M 1.1-2.1 <sup>2)</sup> N 1.4-5, 2.1-2
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### Reinforced Shank

Nominal Size ø d <sub>1</sub>	P	mm					ø d <sub>2</sub>	□	Tool Identification	Dimens. ID	B0911000	B0911020	B0921000	B0911300	B0911400
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>2</sub>	l <sub>3</sub>									
M 2	0.4	45	7	12	2.8	2.1	1.85	.0020	*	*	●	*	*		
M 2.5	0.45	50	9	14	2.8	2.1	2.33	.0025	*	*	●	*	*		
M 3	0.5	56	11	18	3.5	2.7	2.8	.0030	*	*	●	*	*		
M 3.5	0.6	56	12	20	4	3	3.25	.0035	*	*	●	*	*		
M 4	0.7	63	13	21	4.5	3.4	3.7	.0040	*	*	●	*	*		
M 4.5	0.75	70	14	25	6	4.9	4.2	.0045	*	*	●	*	*		
M 5	0.8	70	15	25	6	4.9	4.65	.0050	*	*	●	*	*		
M 6	1	80	17	30	6	4.9	5.6	.0060	*	*	●	*	*		
M 8	1.25	90	20	35	8	6.2	7.45	.0080	*	*	●	*	*		
M 10	1.5	100	22	39	10	8	9.35	.0100	*	*	●	*	*		

### Reduced Shank

Nominal Size ø d <sub>1</sub>	P	mm					ø d <sub>2</sub>	□	Tool Identification	Dimens. ID	C0911000	C0921000	C0911400
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>2</sub>	l <sub>3</sub>							
M 12	1.75	110	24	-	9	7	11.25	.0112	*		●	*	
M 14	2	110	26	-	11	9	13.1	.0114	*		●	*	
M 16	2	110	27	-	12	9	15.1	.0116	*		●	*	
M 18	2.5	125	30	-	14	11	16.85	.0118					
M 20	2.5	140	32	-	16	12	18.85	.0120					

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- M**
- MF
- C
- SELF-LOCK
- Accessories
- Tech. Info

							
<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials		<b>STEEL</b> Steel materials	<b>STEEL</b> Steel materials	
6HX TIN	6HX TIN	6HX TIN	6HX <b>Carbide</b> C/2-3 E/O		6HX TIN C/2-3 E/O/P	6HX TIN C/2-3 E/O	Class of Fit Coating Technical Characteristics
max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>		max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	Thread Depth and Hole Shape
<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>	<b>P 2.1-4.1</b> <b>N 1.4-5</b>		<b>P 1.1-4.1</b> <b>K 2.1</b>	<b>P 1.1-4.1</b> <b>K 2.1</b>	Range of Application

B0921400	B1971400	B1071400	B1970100			B521P300	B523P300	Tool Identification		
Druck 1-STEEL-SN TIN	Druck 1-STEEL-SN IKZ-TIN	Druck 1-STEEL-SN IKZN-TIN	VHM Druck 1-STEEL SN-IKZ			InnoForm 1-STEEL-SN TIN	InnoForm 1-STEEL-SN IKZ-TIN	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
		upon						.0020	M 2	0.4
●						*		.0025	M 2.5	0.45
		request				*		.0030	M 3	0.5
●						*		.0035	M 3.5	0.6
						*		.0040	M 4	0.7
●	●		*			*	*	.0045	M 4.5	0.75
●	●		*			*	*	.0050	M 5	0.8
●	*		*			*	*	.0060	M 6	1
●	●		*			*	*	.0080	M 8	1.25
						*	*	.0100	M 10	1.5

C0921400	C1971400	C1071400	C1970100			C521P300	C523P300	Tool Identification		
Druck 2-STEEL-SN TIN	Druck 2-STEEL-SN IKZ-TIN	Druck 2-STEEL-SN IKZN-TIN	VHM Druck 2-STEEL SN-IKZ			InnoForm 2-STEEL-SN TIN	InnoForm 2-STEEL-SN IKZ-TIN	Dimens. ID	Nominal Size ø d <sub>1</sub>	P
●			*			*	*	.0112	M 12	1.75
	upon	upon				*	*	.0114	M 14	2
●						*	*	.0116	M 16	2
	request	request						.0118	M 18	2.5
								.0120	M 20	2.5

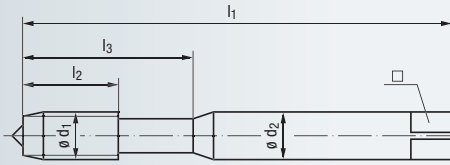
● = In stock    \* = Allow 7 days for delivery

1) Cold-forming in through holes is possible only with external cooling/lubrication  
2) Restricted application possibilities with emulsion

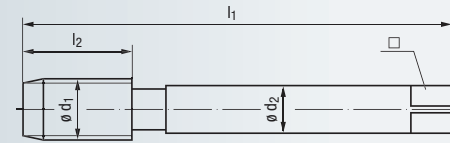


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M**
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



Reinforced Shank  
(M2 - M10)



Reduced Shank  
(M12 - M20)



**VA**  
Stainless steel materials



**VA**  
Stainless steel materials



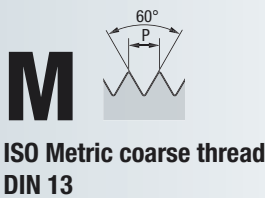
**AL**  
Aluminum wrought alloys



**AL**  
Aluminum wrought alloys



**AL**  
Aluminum wrought alloys



Class of Fit  
Coating  
Technical Characteristics



Thread Depth and Hole Shape

Range of Application

6HX	6HX	6HX	6HX	6HX
GLT-7	GLT-7	GLT-8	GLT-8	GLT-8
C/2-3	C/2-3	C/2-3	C/2-3	<b>E / 1.5-2</b>
E/O/P	E/O	E/O/P	E/O	E/O
max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	
<b>P 1.1-4.1</b>	<b>P 1.1-4.1</b>	<b>N 1.1-4,2,1-2</b>	<b>N 1.1-4,2,1-2</b>	<b>N 1.1-4,2,1-2</b>
<b>M 1.1-3.1 2)</b>	<b>M 1.1-3.1 2)</b>			

### Reinforced Shank

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification	B521N000				
			l <sub>2</sub>	l <sub>3</sub>	□				Dimens. ID	B521N000	B523N000	B521S800	B523S800
M 2	0.4	45	4	12	2.8	2.1	1.85	.0020	InnoForm 1-VA-SN GLT-7	InnoForm 1-VA-SN-IKZ GLT-7	InnoForm 1-AL-SN GLT-8	InnoForm 1-AL-SN-IKZ GLT-8	InnoForm 1-AL/E-SN IKZ-GLT-8
M 2.5	0.45	50	5	14	2.8	2.1	2.33	.0025					
M 3	0.5	56	6	18	3.5	2.7	2.8	.0030					
M 3.5	0.6	56	7	20	4	3	3.25	.0035					
M 4	0.7	63	7	21	4.5	3.4	3.7	.0040					
M 4.5	0.75	70	8	25	6	4.9	4.2	.0045					
M 5	0.8	70	8	25	6	4.9	4.65	.0050	*	*	*	*	*
M 6	1	80	10	30	6	4.9	5.6	.0060	*	*	*	*	*
M 8	1.25	90	14	35	8	6.2	7.45	.0080	*	*	*	*	*
M 10	1.5	100	16	39	10	8	9.35	.0100	*	*	*	*	*

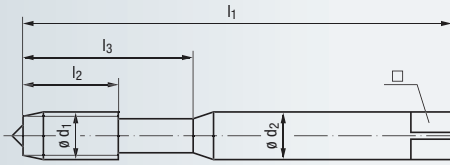
### Reduced Shank

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification	B521N000				
			l <sub>2</sub>	l <sub>3</sub>	□				Dimens. ID	B521N000	B523N000	B521S800	B523S800
M 12	1.75	110	18	-	9	7	11.25	.0112					
M 14	2	110	20	-	11	9	13.1	.0114					
M 16	2	110	22	-	12	9	15.1	.0116					
M 18	2.5	125	25	-	14	11	16.85	.0118					
M 20	2.5	140	25	-	16	12	18.85	.0120					

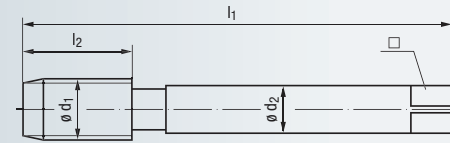


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M**
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

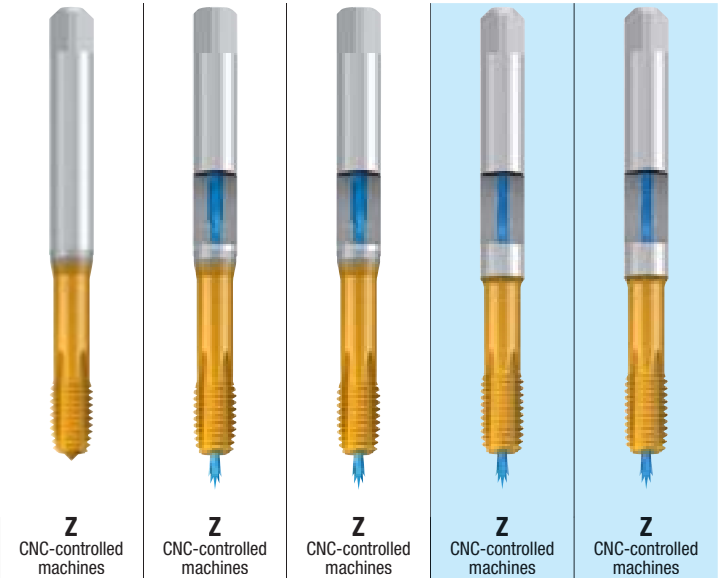
### DIN Length • DIN Shank



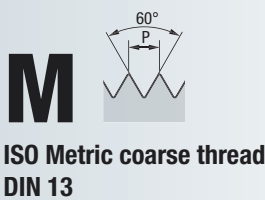
Reinforced Shank  
(M2 - M10)



Reduced Shank  
(M12 - M20)



**Z** CNC-controlled machines  
**Z** CNC-controlled machines  
**Z** CNC-controlled machines  
**Z** CNC-controlled machines  
**Z** CNC-controlled machines



Class of Fit	6HX	6HX	6HX	6HX	6HX
Coating	TIN-T1	TIN-T1	TIN-T1	TIN-T1	TIN-T1
Technical Characteristics	C / 2-3	C / 2-3	<b>E / 1.5-2</b>	C / 2-3	<b>E / 1.5-2</b>
	E / O / P	E / O	E / O	E / O	E / O

Thread Depth and Hole Shape	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>	max. 3 x d <sub>1</sub>
-----------------------------	-------------------------	-------------------------	-------------------------	-------------------------	-------------------------

Range of Application	<b>P 1.1-4.1</b> <b>M 1.1-3.1 2)</b> <b>K 2.1</b> <b>N 2.1-2, 2.4-5</b> <b>S 1.1-2.2 2)</b> <b>S 2.4 2)</b>	<b>P 1.1-4.1</b> <b>M 1.1-3.1 2)</b> <b>K 2.1</b> <b>N 2.1-2, 2.4-5</b> <b>S 1.1-2.2 2)</b> <b>S 2.4 2)</b>	<b>P 1.1-4.1</b> <b>M 1.1-3.1 2)</b> <b>K 2.1</b> <b>N 2.1-2, 2.4-5</b> <b>S 1.1-2.2 2)</b> <b>S 2.4 2)</b>	<b>P 2.1-5.1</b> <b>N 1.4-6, 2.4-5</b>	<b>P 2.1-5.1</b> <b>N 1.4-6, 2.4-5</b>
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### Reinforced Shank

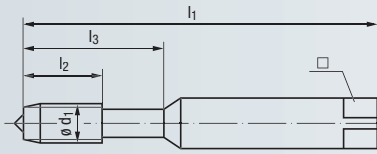
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	l <sub>2</sub>	mm			ø d <sub>2</sub>	□	Tool Identification		B521A800	B523A800	B531A800	B523P900	B531P900
				l <sub>3</sub>	l <sub>2</sub>	l <sub>3</sub>			Dimens. ID	Dimens. ID					
M 2	0.4	45	4	12	2.8	2.1	1.85	.0020	InnoForm 1-Z-SN TIN-T1	InnoForm 1-Z-SN-IKZ TIN-T1	InnoForm 1-Z/E-SN-IKZ TIN-T1	VHM InnoForm 1-Z-SN-IKZ TIN-T1	VHM InnoForm 1-Z/E-SN-IKZ TIN-T1		
M 2.5	0.45	50	5	14	2.8	2.1	2.33	.0025							
M 3	0.5	56	6	18	3.5	2.7	2.8	.0030	*						
M 3.5	0.6	56	7	20	4	3	3.25	.0035	*						
M 4	0.7	63	7	21	4.5	3.4	3.7	.0040	*						
M 4.5	0.75	70	8	25	6	4.9	4.2	.0045							
M 5	0.8	70	8	25	6	4.9	4.65	.0050	*	*	*	*	*	*	*
M 6	1	80	10	30	6	4.9	5.6	.0060	*	*	*	*	*	*	*
M 8	1.25	90	14	35	8	6.2	7.45	.0080	*	*	*	*	*	*	*
M 10	1.5	100	16	39	10	8	9.35	.0100	*	*	*	*	*	*	*

### Reduced Shank

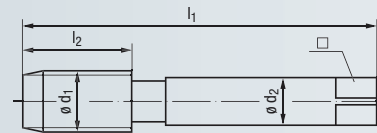
Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	l <sub>2</sub>	mm			ø d <sub>2</sub>	□	Tool Identification		C521A800	C523A800	C531A800		
				l <sub>3</sub>	l <sub>2</sub>	l <sub>3</sub>			Dimens. ID	Dimens. ID					
M 12	1.75	110	18	-	9	7	11.25	.0112	InnoForm 2-Z-SN TIN-T1	InnoForm 2-Z-SN-IKZ TIN-T1	InnoForm 2-Z/E-SN-IKZ TIN-T1				
M 14	2	110	20	-	11	9	13.1	.0114							
M 16	2	110	22	-	12	9	15.1	.0116	*	*	*				
M 18	2.5	125	25	-	14	11	16.85	.0118							
M 20	2.5	140	25	-	16	12	18.85	.0120							



**ANSI Length • ANSI Shank**



Reinforced Shank  
(M4 - M10)



Reduced Shank  
(M12 - M20)



**STEEL**  
Steel materials



**STEEL**  
Steel materials

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M**
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

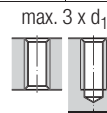
**M**

**ISO Metric coarse thread  
DIN 13**

Class of Fit  
Coating  
Technical Characteristics

6HX	6HX
NT	TIN
C/2-3	C/2-3
O/P	E/O/P

Thread Depth and Hole Shape



Range of Application

P 1.1-3.1	P 1.1-3.1
	M 1.1-2.1 <sup>2)</sup>
	N 1.4-5, 2.1-2

Tool Identification		AU921000	AU921400		
	Dimens. ID	Druck STEEL-SN	Druck STEEL-SN TIN		
	.0040				
	.0050				
	.0060	●	●		
	.0080	●	●		
	.0100	●	●		
	.0112	●	●		
	.0114				
	.0116				
	.0120				

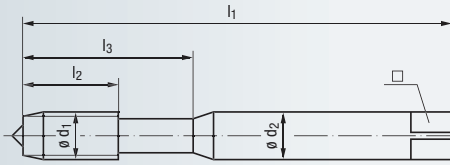
Nominal Size $\phi d_1$	P mm	inch							
		$l_1$	$l_2$	$l_3$	$\phi d_2$	$\square$			
M 4	0.7	2 1/8	2.13	0.512	0.827	0.168	0.131	3.7	.0040
M 5	0.8	2 3/8	2.38	0.591	0.945	0.194	0.152	4.65	.0050
M 6	1	2 1/2	2.50	0.669	1.142	0.255	0.191	5.6	.0060
M 8	1.25	2 23/32	2.72	0.787	1.299	0.318	0.238	7.45	.0080
M 10	1.5	2 15/16	2.94	0.866	1.378	0.381	0.286	9.35	.0100
M 12	1.75	3 3/8	3.38	0.984	—	0.367	0.275	11.25	.0112
M 14	2	3 19/32	3.59	1.024	—	0.429	0.322	13.1	.0114
M 16	2	3 13/16	3.81	1.063	—	0.480	0.360	15.1	.0116
M 20	2.5	4 15/32	4.47	1.181	—	0.652	0.489	18.85	.0120

<sup>2)</sup> Restricted application possibilities with emulsion

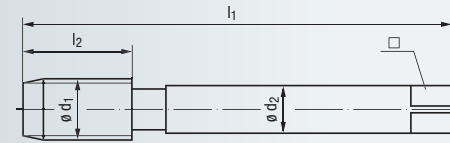


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length · DIN Shank



Reinforced Shank  
(M3x0.35 - M10x1.25)



Reduced Shank  
(M12x1.5 - M20x1.5)



**STEEL**  
Steel materials



**STEEL**  
Steel materials



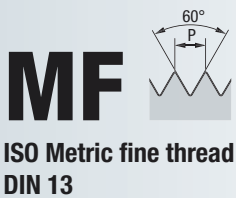
**STEEL**  
Steel materials



**STEEL**  
Steel materials



**STEEL**  
Steel materials

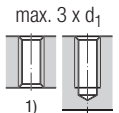
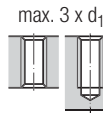


**ISO Metric fine thread  
DIN 13**

Class of Fit  
Coating  
Technical Characteristics



Thread Depth  
and Hole Shape



Range of Application

P 1.1-3.1

P 1.1-3.1

P 1.1-3.1

M 1.1-2.1 2)

N 1.4-5, 2.1-2

P 1.1-3.1

M 1.1-2.1 2)

N 1.4-5, 2.1-2

P 1.1-3.1

M 1.1-2.1 2)

N 1.4-5, 2.1-2

### Reinforced Shank

Nominal Size Ø d <sub>1</sub>	P	mm					Ø d <sub>2</sub>	□	Tool Identification
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	Ø d <sub>2</sub>	□			
M 3 x 0.35	56	8	18	3.5	2.7	2.88	.0202		
M 4 x 0.5	63	10	21	4.5	3.4	3.8	.0210		
M 5 x 0.5	70	11	25	6	4.9	4.8	.0218	*	
M 6 x 0.75	80	13	30	6	4.9	5.7	.0229	*	
M 8 x 0.75	80	14	30	8	6.2	7.7	.0250	*	
M 8 x 1	90	17	35	8	6.2	7.6	.0251	*	
M 10 x 1	90	18	35	10	8	9.6	.0276	*	
M 10 x 1.25	100	18	39	10	8	9.45	.0277		

Tool Identification	B0911000	B0921000	B0911400	B0921400
Druck 1-STEEL	*	*	*	*
Druck 1-STEEL-SN				
Druck 1-STEEL TIN				
Druck 1-STEEL-SN TIN				

### Reduced Shank

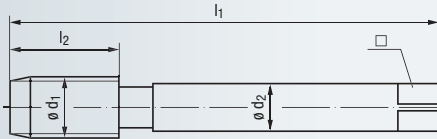
Nominal Size Ø d <sub>1</sub>	P	mm					Ø d <sub>2</sub>	□	Tool Identification
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	Ø d <sub>2</sub>	□			
M 12 x 1.5	100	22	-	9	7	11.35	.0303		
M 14 x 1.25	100	22	-	11	9	13.45	.0330		
M 14 x 1.5	100	22	-	11	9	13.35	.0331	*	
M 16 x 1.5	100	22	-	12	9	15.35	.0359	*	
M 18 x 1.5	110	25	-	14	11	17.35	.0390	*	
M 20 x 1.5	125	25	-	16	12	19.35	.0422	*	

Tool Identification	C0911000	C0921000	C0911400	C0921400	C1971400
Druck 2-STEEL	*	*	*	*	
Druck 2-STEEL-SN					upon
Druck 2-STEEL TIN					request
Druck 2-STEEL-SN TIN					
Druck 2-STEEL-SN IKZ-TIN					



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G**
- SELF-LOCK
- Accessories
- Tech. Info

### DIN Length • DIN Shank



Reduced Shank



**STEEL**  
Steel materials

**STEEL**  
Steel materials

**STEEL**  
Steel materials

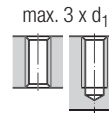
**G**

**Whitworth pipe thread  
DIN EN ISO 228**

Class of Fit  
Coating  
Technical Characteristics

"X"	"X"	"X"
NT	TIN	TIN
C/2-3	C/2-3	C/2-3
O/P	E/O/P	E/O/P

Thread Depth and Hole Shape



Range of Application

<b>P 1.1-3.1</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>	<b>P 1.1-3.1</b> <b>M 1.1-2.1 2)</b> <b>N 1.4-5, 2.1-2</b>
------------------	--	--

### Reduced Shank

Nominal Size ø d <sub>1</sub>	T.P.I.	mm		mm			□
		ø d <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	ø d <sub>2</sub>	□	
G 1/16	28	7.72	90	17	6	4.9	
G 1/8	28	9.73	90	18	7	5.5	
G 1/4	19	13.16	100	22	11	9	
G 3/8	19	16.66	100	22	12	9	
G 1/2	14	20.96	125	25	16	12	
G 5/8	14	22.91	125	25	18	14.5	
G 3/4	14	26.44	140	28	20	16	
G 7/8	14	30.20	150	28	22	18	
G 1	11	33.25	160	30	25	20	

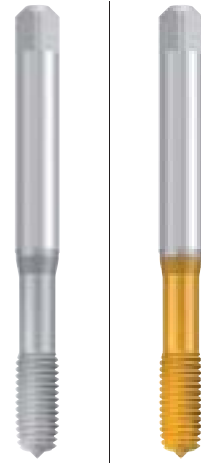
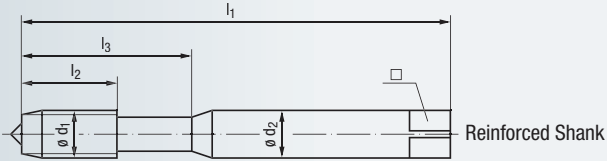
### Tool Identification

Image	Dimens. ID
	.4034
	.4035
	.4036
	.4037
	.4038
	.4039
	.4040
	.4041
	.4042

C0911000	C0911400	C0921400
Druck 2-STEEL	Druck 2-STEEL TIN	Druck 2-STEEL-SN TIN
*	*	*
*	*	*
*	*	*
*	*	*
*	*	*
*	*	*
*	*	*
*	*	*

2) Restricted application possibilities with emulsion

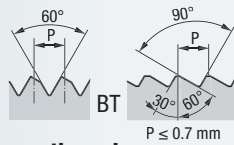
**DIN Length • DIN Shank**



**STEEL**  
Steel materials

**STEEL**  
Steel materials

**LK-M**

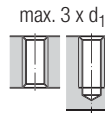


**Metric SELF-LOCK coarse thread  
EMUGE standard**

Type  
Coating  
Technical Characteristics

BT	BT
NT	TIN
C/2-3	C/2-3
O/P	E/O/P

Thread Depth and Hole Shape



Range of Application

P 1.1-3.1	P 1.1-3.1
	M 1.1-2.1 2)
	N 1.4-5, 2.1-2

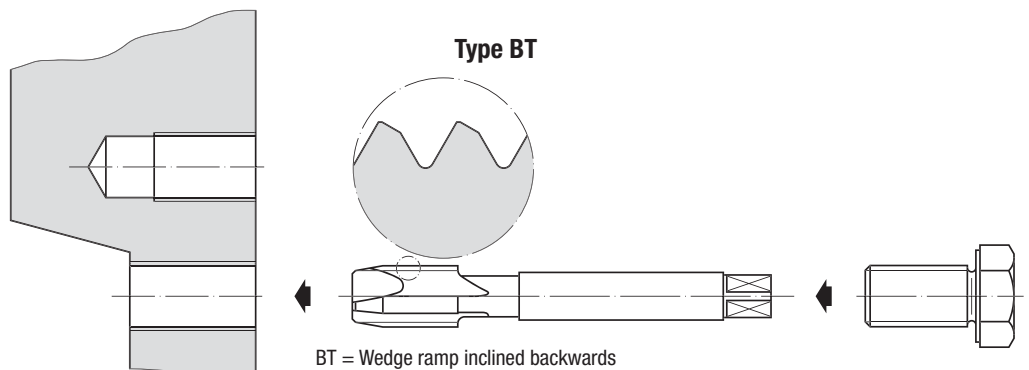
**Reinforced Shank**

Nominal Size ø d <sub>1</sub>	P	l <sub>1</sub>	mm			ø d <sub>2</sub>	□	Tool Identification		B0911000	B0911400			
			l <sub>2</sub>	l <sub>3</sub>					Dimens. ID					
LK-M 3	0.5	56	11	18	3.5	2.7	2.85	.1046	★	★				
LK-M 4	0.7	63	13	21	4.5	3.4	3.8	.1048	★	★				
LK-M 5	0.8	70	15	25	6	4.9	4.8	.1050	★	★				
LK-M 6	1	80	17	30	6	4.9	5.7	.1052	★	★				
LK-M 8	1.25	90	20	35	8	6.2	7.6	.1054	★	★				
LK-M 10	1.5	100	22	39	10	8	9.5	.1056	★	★				

2) Restricted application possibilities with emulsion

**The alternative in locking thread technology and thread stripping prevention.**

- Self-locking internal thread form
- For standard external fasteners
- Eliminates need for costly and ineffective inserts or locking parts
- Ease of assembly
- Provides uniform distribution of load over the entire thread length
- Reduces probability of thread stripping in aluminum and other soft materials



★ = Allow 7 days for delivery

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK**
- Accessories
- Tech. Info



- Product Finder
- Vc
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info



## Technical information

		Page
2.1	General technical information regarding EMUGE threading tools	174
2.2	Dimensions and technical sales conditions	174
2.3	Constructional designs of our EMUGE roll form taps	174
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Product  
FinderV<sub>c</sub>

UNC

UNF

M

MF

G

SELF-LOCK

Accessories

Tech. Info



- Product Finder
- $v_c$
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info**

## 2.1 General technical information regarding EMUGE threading tools

EMUGE threading tools are made exclusively of high-performance high-speed steels according to EMUGE specifications. Our modified tool steels are based on the material alloy group HSSE acc. DIN ISO 11054.

As for tools which are designed for a special application, these generally used tool materials do not come up to our requirements. In such cases we use special high-speed steel alloys and carbide materials which are specially selected for the work case in question. A rigorous quality control of these materials forms the basis of our high-quality tools. Research and development work is carried out in a specially equipped laboratory, and serves as an indispensable precondition for the further development of cutting geometries and other parameters necessary for thread production. Extensive tests and trials on CNC machines, conventional drilling and thread cutting machines guarantee the performance and economic efficiency of our tools.

## 2.2 Dimensions and technical sales conditions

The dimensional specifications of our threading tools are adjusted to the currently valid standards, with the exception of special tools made to EMUGE standards.

The DIN standards for taps are based on the General Plans of Dimensions for Taps acc. DIN 2184-1 and -2.




Please read the notes in this catalog and in the technical introduction carefully.

The technical sales conditions for taps acc. DIN 2197 and roll form taps acc. DIN 2175 have been taken into account.

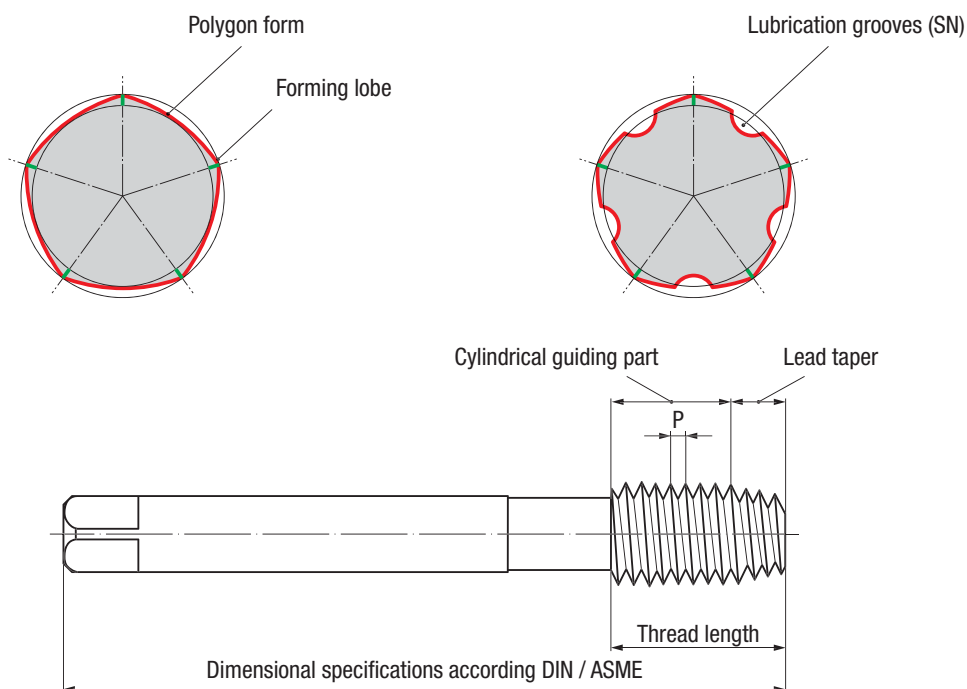
The manufacturing tolerances for the thread part are in accordance with DIN EN 22857 and DIN 802.

All specifications, illustrations and dimensions are subject to change due to technical progress and possible changes of the standards, and are consequently without obligation.

## 2.3 Constructional designs of our EMUGE roll form taps

	Constructional design	EMUGE designation
	Short machine roll form taps	<b>Druck</b>
	Machine roll form taps with reinforced shank	<b>Druck 1 InnoForm 1</b>
	Machine roll form taps with reduced shank	<b>Druck 2 InnoForm 2</b>

### Geometric construction of a roll form tap





## 2.4 Special roll form tap types (examples)

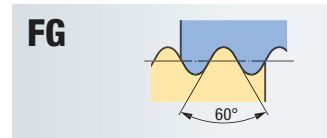
### Special taps to customers' specifications

EMUGE produces special roll form taps to customers' drawings and proper specifications.

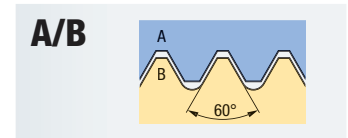
### InnoForm special tools

If our comprehensive InnoForm program of roll form taps does not include a suitable tool design for a specific application, we will be happy to furnish a custom-made, special InnoForm tool designed for the work conditions and according to the workpiece drawing of the individual customer. Such special designs can be made in special thread sizes and tolerances, with special thread profiles and dimensional specifications, or for special processes involving combined thread cutting and cold forming.

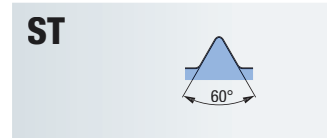
### Special threads (examples)



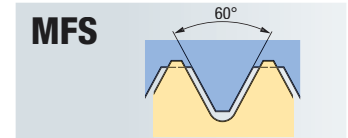
**FG**  
Bicycle thread  
acc. DIN 79012



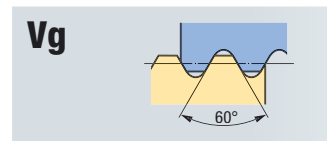
**A/B**  
Tripod connection thread  
acc. DIN 4503



**ST**  
Sheet metal screw thread  
acc. DIN EN ISO 1478



**MFS**  
ISO Metric thread for tight fit  
acc. DIN 8141-1



**Vg**  
Valve thread  
acc. DIN 7756

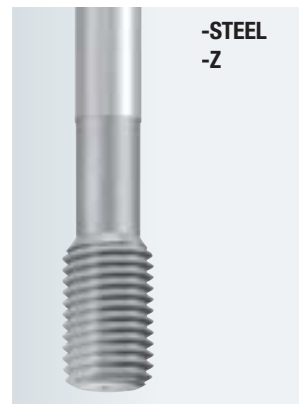
## 2.5 Basic types of our EMUGE roll form taps

EMUGE is the first threading tool manufacturer worldwide to introduce a program of roll form taps specially designed for the machining of specific materials or material groups. While this was possible only for cutting tools in the past, we have now succeeded in designing roll form taps especially for the special properties of single materials and material groups, sometimes increasing performance in a dramatic way.

Conventional roll form taps were made for the use in all ductile materials: potential performance features in defined applications were simply wasted in the process.

EMUGE has made extensive investigations into the mechanisms of cold forming for years, and developed an entirely new tool generation from the results. In order to highlight the uniqueness of this highly innovative program of roll form taps, we have thought of a new name: **InnoForm**

### Druck



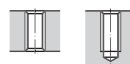
- Roll form tap for the chipless production of internal threads
- Lead taper form E (1.5-2 threads)
- Lead taper form C (2-3 threads)
- Lead taper form D (4-5 threads)
- For blind hole and through hole threads

#### Note:

Depending on the workpiece material, the essential advantages of the cold-forming of threads are not only excellent surface quality but also higher static and dynamic strength of the thread.

The length of the thread to be produced is not limited by chips which must be removed. The tools feature an excellent stability, especially with small thread sizes. All ductile materials can be cold-formed. Sufficient lubrication is essential. We generally recommend using oil grooves for through hole threads and horizontal machining (exception: very short through hole threads, e.g. sheet metal components). Sometimes, it is necessary to adjust the recommended drill diameter to work conditions.

### InnoForm



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
- G
- SELF-LOCK
- Accessories
- Tech. Info

## 2.6 Our EMUGE geometries

### STEEL

#### For steel materials

This highly successful geometry has been designed for general use in steel. It is available ex stock in numerous thread systems and sizes. Circumference speeds can be increased by combining it with a suitable hard surface coating.

### VA

#### For stainless steel materials and steel materials

These materials show a high degree of adhesion which can lead to cold-welding effects. Also, they tend to strengthening during the forming process which puts more stress on the forming lobes. In order to compensate this, we have developed a geometry which meets the elevated requirements towards stability perfectly.

### AL

#### For aluminum wrought alloys

Under the usual lubrication conditions, e.g. emulsion lubrication, these materials show a strong inclination to adhesion in the cold forming of threads. In order to obtain satisfactory work results in spite of these unfavourable material properties, this geometry was provided with a coating that offers excellent friction characteristics and, as a result, a perfect degree of process safety.

### GAL

#### For aluminum cast alloys

Cast aluminum materials exert a very strong abrasive stress on the forming lobes of a cold-forming tap during work. In addition, the ductile properties of these rather brittle materials must be regarded as relatively poor. In order to achieve easier thread production and better wear resistance even under these bad conditions, we have given this tool type a specially adjusted geometry and an additional hard surface coating.

### H

#### For materials of high tensile strength

This geometry was designed for the cold forming of materials with restricted ductile properties. The special tool geometry, combined with an appropriate hard surface coating, provides excellent quality of the finished threads and very good wear resistance.

### Z

#### For CNC-controlled machines

This geometry is aimed at reducing the unavoidable friction forces and the heat stress on the forming lobes especially for use on CNC-controlled machines. With a synchronous feed control, the performance potential of these tools can be used to the full, especially in combination with the collet holders of our Softsynchro® series.

## 2.7 Our EMUGE surface treatments and coatings

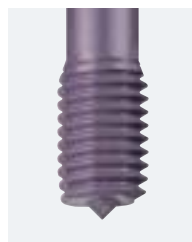
### NT



#### Nitriding

In a thermo-chemical treatment, the surface is enriched with nitrogen to a depth of approx. 0.03 to 0.05 mm. Since the surface becomes very hard (1000-1250 HV), nitrided tools are a very good choice for abrasive materials like cast iron, spheroidal cast iron, cast aluminum and duroplastics. Tool life is increased in a decisive manner.

### TICN



#### Titanium carbonitride (blue-grey)

In a PVD process (500 °C) a coating thickness of 2-4 µm can be realised. The hardness is approx. 3000 HV. The TICN coating will resist up to approx. 400 °C.

### TIN, TIN-T1, TIN-T26



#### Titanium-nitride (gold-yellow)

In a PVD process (500 °C) a coating thickness of 1-4 µm can be realised. The hardness of approx. 2300 HV, the good sliding properties and coating adhesion guarantee long tool life. The special structure of the multi-layer coatings TIN-T1 and TIN-T26 helps to achieve considerable tool life increases.

### GLT-7



#### Hard surface coating with anti-friction layer (black-grey)

In a PVD process (500 °C) a coating thickness of 2-4 µm can be realised. The hardness is approx. 3000 HV. The combination of a multi-layer hard coating with a superimposed anti-friction layer provides optimal wear resistance especially in deep blind holes. This coating will remain resistant up to approx. 400 °C.

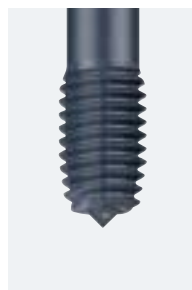
### CR



#### Hard chrome plating

The hard chrome surface reaches a hardness of 1200 to 1400 HV, and shows excellent anti-friction properties. The thickness of the coating is 2-4 µm. Tool life can be considerably increased, especially in non-ferrous metals and thermoplastics. However, we do not recommend the use of this coating in steel materials. Here, temperatures of 250 °C are often exceeded in a cold-forming process, and that might endanger the adhesion of the hard chrome plating.

### GLT-8



#### Diamond-like, amorphous carbon coating (black-grey)

In a PVD process a coating thickness of 1-2 µm can be realised. The hardness is approx. 2500 HV. This mono-layer coating is an excellent choice for the machining of non-ferrous metals and aluminum with a low silicon content (< 9% Si). Thanks to the low friction, material adhesion is drastically reduced. This coating will remain resistant up to approx. 350 °C.

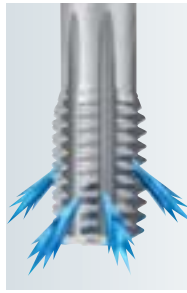
## 2.8 Other EMUGE abbreviations

### IKZ



**Internal coolant supply, axial (DIN designation: KA)**  
The axial exit of coolant-lubricant provides optimum cooling and lubrication in the lead taper area.

### IKZN



**Internal coolant supply, axial, with coolant exiting in the flutes (DIN designation: KR)**  
Radial exit of coolant-lubricant is the safest solution for providing coolant supply in the lead taper area even in through holes.

### VHM

#### Solid carbide

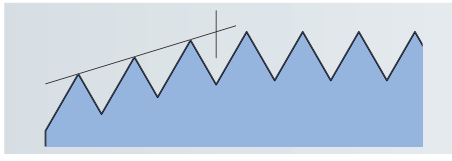
Tools with a thread diameter < 12.5 mm are made of solid carbide (thread part and shank).

## 2.9 Lead taper forms

Lead taper forms and lead taper lengths for roll form taps acc. DIN 2175.

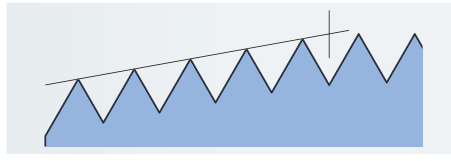
### Form C

Lead taper length 2-3 threads



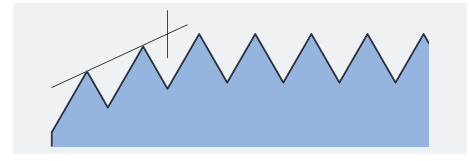
### Form D

Lead taper length 3-5.5 threads



### Form E

Lead taper length 1.5-2 threads



## 2.10 Cooling and lubrication agents

Lubricants are often, if not generally, given too little consideration. If you want to get the best performance out of your tool you have to take care to use the best coolant-lubricant available. In general, we distinguish the following types of cooling and lubrication:



### A

#### Dry machining, pressurized air, cold pressurized air

"Real" dry machining is mostly used only in cast iron. Pressurized air, sometimes cooled, is used in some cases for chip removal.

### E

#### Emulsion

The most common type of coolant-lubricant on machining centres.

### O

#### Thread cutting oil

With these oils which are perfectly adjusted to specific materials, excellent thread surfaces and tool life can be achieved.

### M

#### Minimum-quantity lubrication (MQL)

Due to the more and more common option of supplying aerosol through the spindle on modern machining centres, this type of cooling and lubrication is gaining more and more popularity.

### P

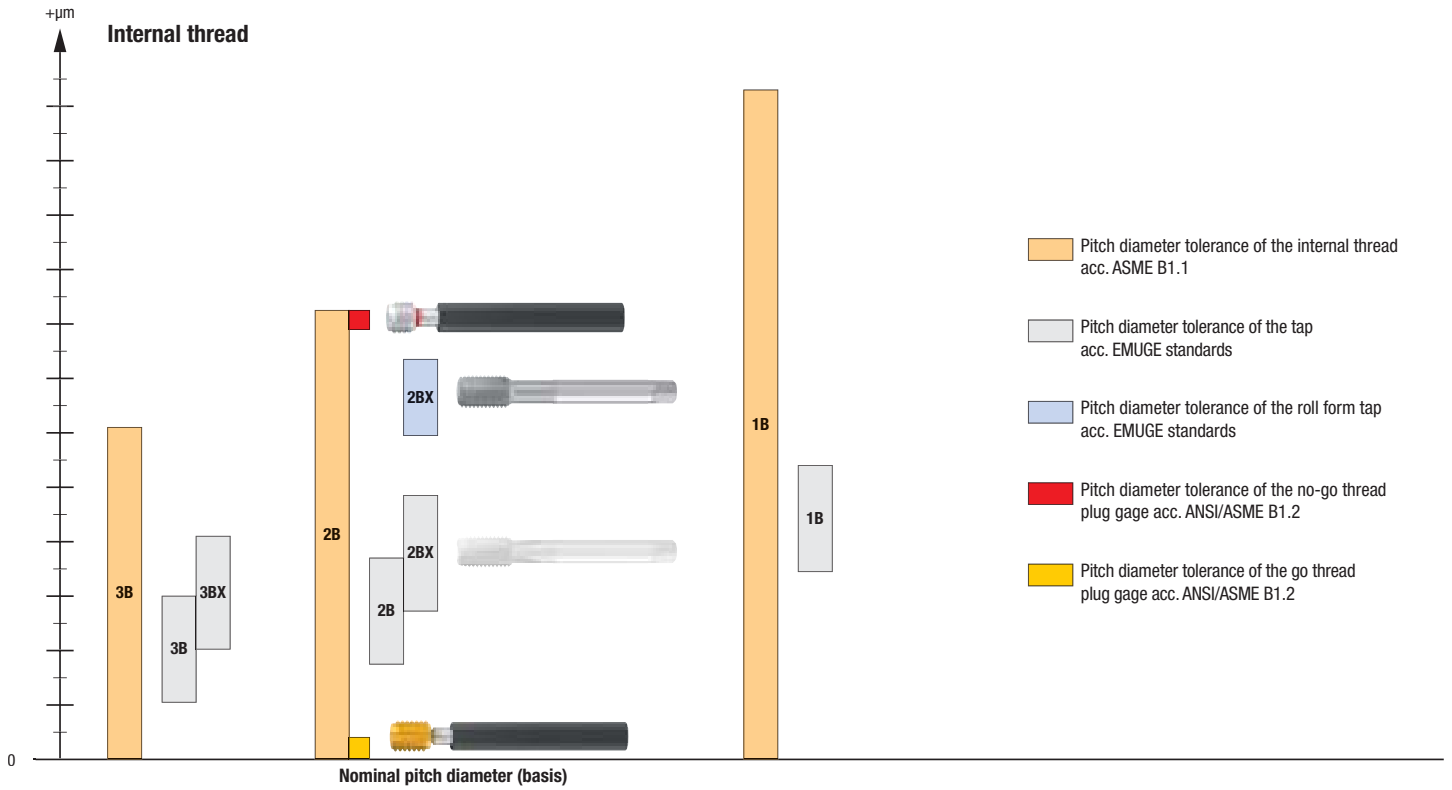
#### Thread cutting paste

Perfectly suitable for the cold forming of threads. Especially useful in horizontal machining, with large thread sizes and through hole threads. To be used only for brush lubrication.

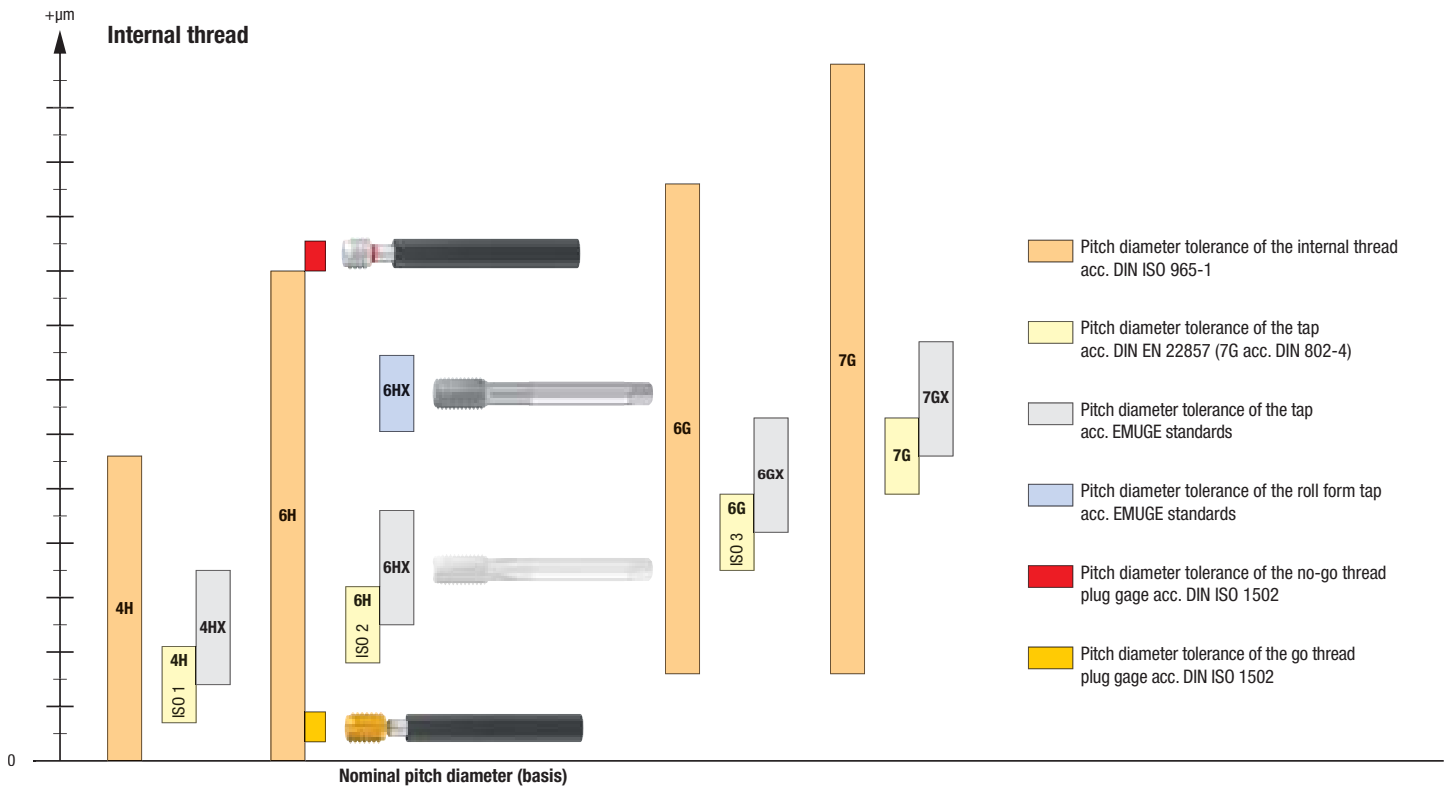


- Product Finder
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### 2.11 Tolerance zones of the pitch diameter on the Unified thread (graphic representation)



### 2.12 Tolerance zones of the pitch diameter on the Metric thread (graphic representation)



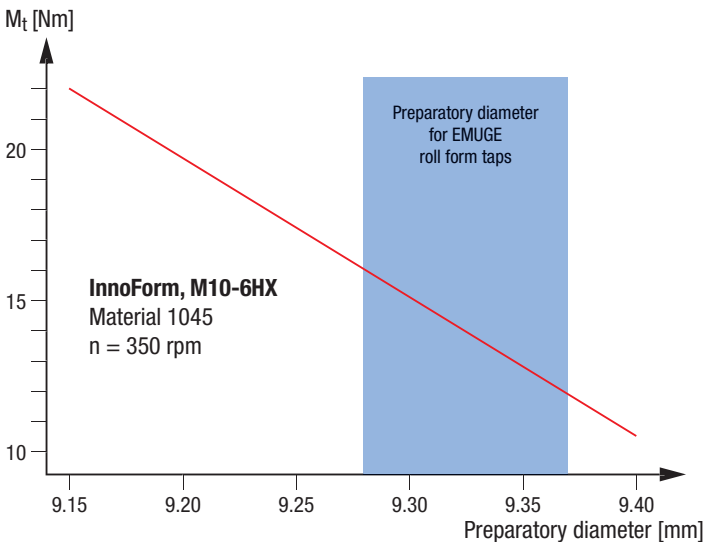
### 2.13 Cold forming and torque

#### Technical data of the workpiece material

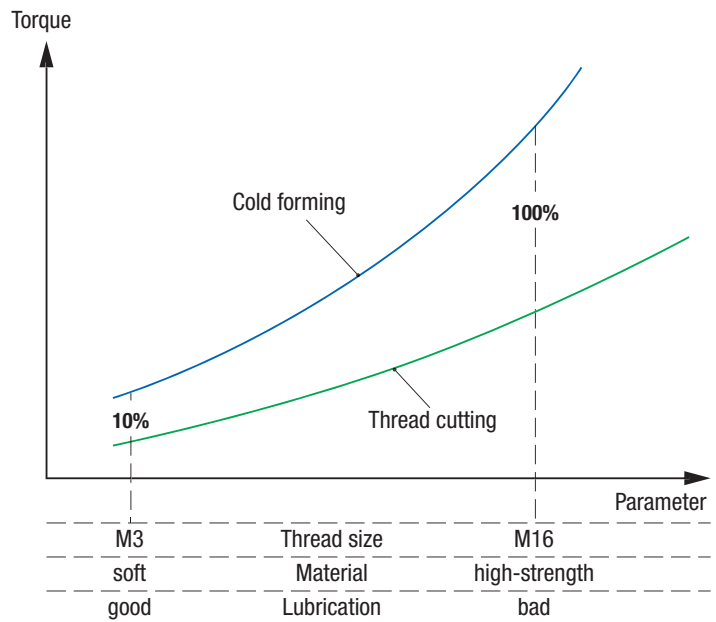
Not all materials are suitable for cold forming. For that, they must show a minimum value of ductility and must not exceed a certain maximum strength. Suitable materials usually have a tensile strength of less than 1400 N/mm<sup>2</sup> and a minimum fracture strain of 5%. In addition, different materials and their alloys lead to very specific flow properties and strengthening characteristics. Obviously, wrought aluminum, high-strength steel or stainless materials will react in very different ways.

#### Torque

Torque, in the cold forming of threads, depends mostly on the workpiece material, the thread size, lubrication and preparatory diameter, as well as on the geometry and the coating of the tool. The influence of the preparatory diameter on torque is shown in the following diagram.



The following diagram demonstrates the difference in torque between thread cutting and cold forming.



### 2.14 Cold forming as a production process

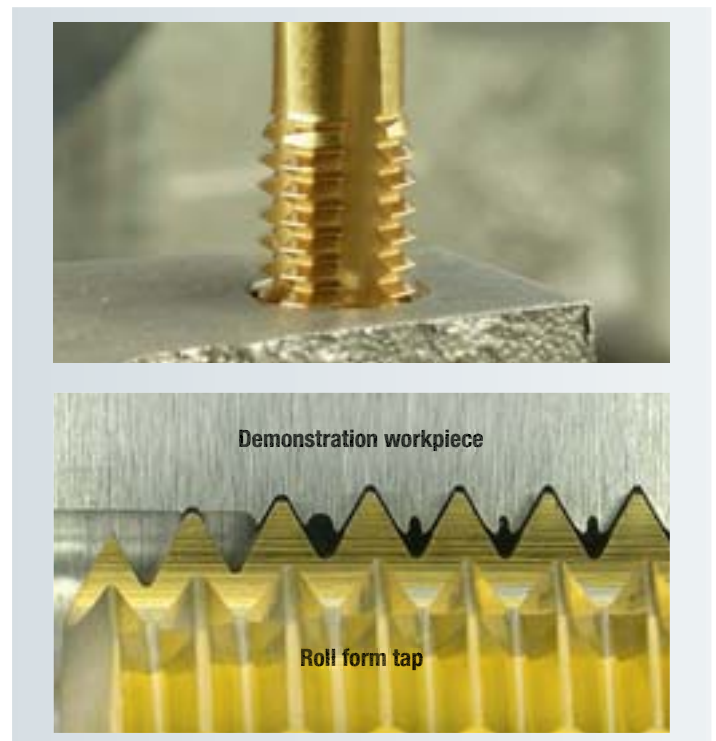
The cold forming of threads, according to DIN 8583-5, belongs to the pressure-forming processes. The internal thread is produced by the impression of a helical sequence of thread teeth into the formerly prepared thread hole, the desired profile is formed by pressure.

A roll form tap is provided with a lead taper and a cylindrical guiding part. The thread helix runs on through both parts. If you look at a cross-section of the tool, there is a polygon shape to be recognized at a right angle to the tool axis. This polygon shape provides forming lobes which carry the effective thread profile.

The lead portion of a roll form tap is made as a lead taper, in which the helical thread line is continuously increasing in diameter. In the cold-forming process, the lead taper produces the thread, the forming lobes penetrating the workpiece successively in a radial direction by forming the thread. During this process, the workpiece material “flows” from the thread crests along the thread flanks into the area of the minor thread diameter. This creates smooth flank surfaces and, in the minor diameter area, the typical space pocket.

The cylindrical guiding part of the roll form tap makes the surface of the produced thread even smoother, and serves to firmly guide the tool axially. Depending on the workpiece material, the essential advantages of cold forming include excellent surface quality but also increased static and dynamic strength of the thread. The length of the thread to be produced is not limited by chips which need to be removed, so process safety is extremely good.

The excellent self-guiding characteristics of a roll form tap prevent axial “miscutting”. The extraordinary stability of the tools is very helpful, especially with small diameters.



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- M
- MF
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- Accessories
- Tech. Info**

## 2.15 The difference between a cut thread and a cold-formed thread

With a cut thread, the permissible stress values are limited due to the fact that the grain structure of the material is cut. Also, flank angle errors can occur easily; these will cause a very unfavourable distribution of stress on the thread and limit its holding strength. With a cold-formed thread, the grain of the material is not cut or interrupted, and the material itself shows increased strength, due to its having been compressed by cold-forming. Flank angle errors which are quite common in cut threads are prevented by the material being formed, without any play, along the thread flanks of the tap. The incomplete minor diameter, typical for cold-formed threads, has no influence on the stripping resistance of the thread.

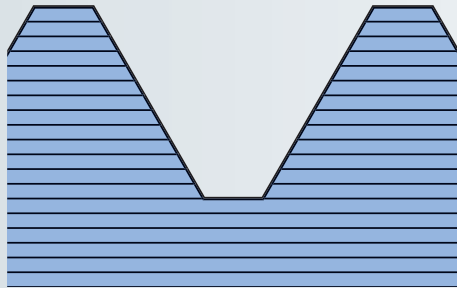
Cold forming causes material strengthening on the thread flanks and especially in the root area of the thread. This strengthening of the material structure has a very positive influence on the vibration properties and the general resistance of the thread under dynamic stress.

### Maximum thread depth, maximum thread pitch

The maximum thread depth to be achieved and the fastest possible thread pitch to be produced by cold-forming are a topic about which a general statement is impossible. The possible thread depth is definitely larger than it could be with a cutting tap. In practical work, it depends primarily on the quality of cooling/lubrication, and is limited by the constructional length of the tool.

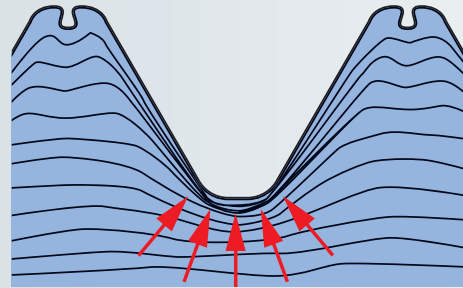
The maximum thread pitch in cold forming is limited by the workpiece material properties.

Cut thread



Grain structure in a cut thread

Cold-formed thread



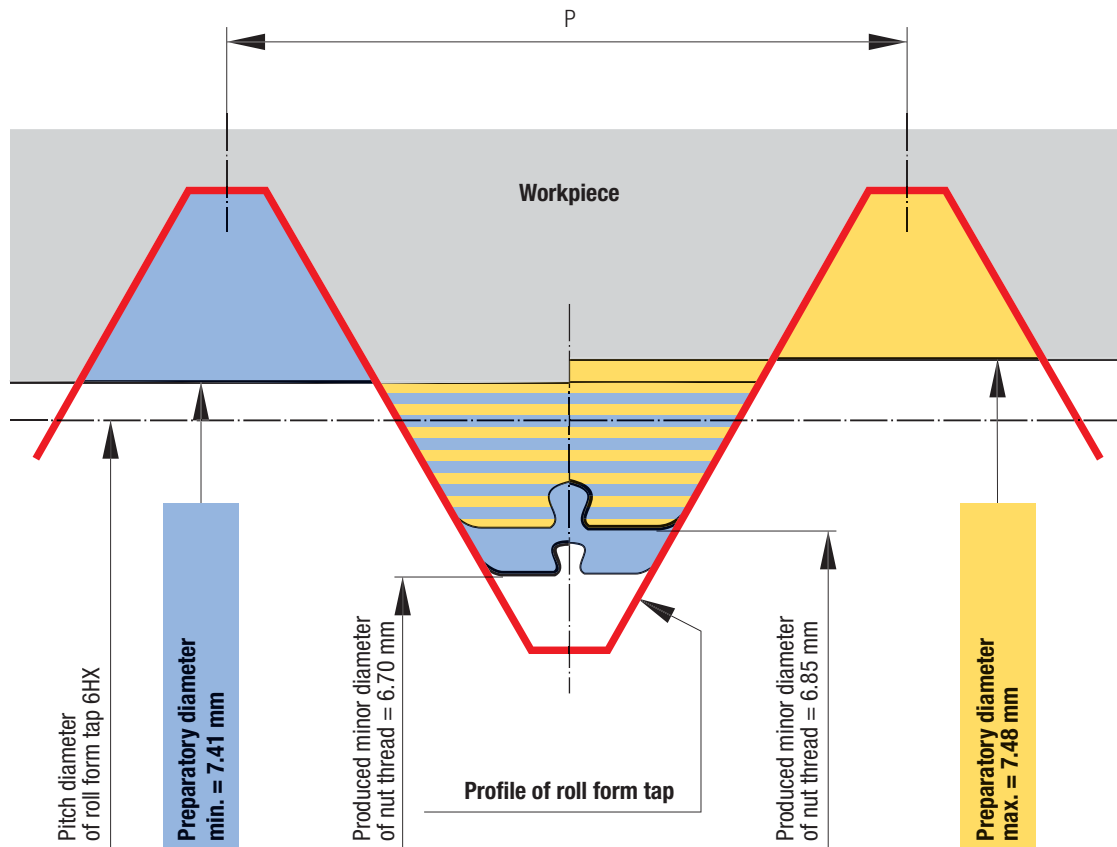
Grain structure in a cold-formed thread, strengthening in the root area / on the major diameter which is especially exposed to the danger of crack formation increases resistance

## 2.16 Preparatory diameters for roll form taps

### The influence of the preparatory diameter

If the preparatory diameter is too small the workpiece material is overformed in the thread root and there are excessive process forces. If the preparatory diameter is too large the thread root is not sufficiently formed, the minor diameter is too small. In order to preclude such negative effects, the tolerance of roll form taps is narrowed down from the start. **In some cases where the forming characteristics are very extraordinary it may be necessary to go without a standard preparatory diameter entirely, and to find the correct diameter by testing.**

It is important to know that the preparatory diameter has a decisive influence on the minor diameter of the nut thread, as the following example shows. Every lack of precision, every kind of surface roughness will be mirrored in the finished internal thread and its minor diameter.



Cold-formed thread M8-6HX in corrosion- and acid-proof material, e.g. material no. 316 or 316Ti, with different preparatory diameters

Nut height =  $2 \times d$   
 $v_c = 21$  SFM  
 $n = 255$  rpm

Coolant-lubricant:  
 EMUGE thread cutting oil no. 5+ HIGH ALLOY

While the observation of the pitch diameter tolerance of the internal thread, e.g. ISO Metric thread 6H, offers no problems usually, deviations in the minor diameter of the internal or nut thread must be expected, as demonstrated above.

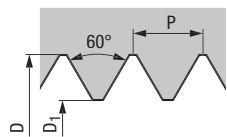
The extended minor diameter tolerances for cold-formed internal threads are specified in DIN 13-50. This standard allows a 7H tolerance for the minor diameter of the nut thread, with a pitch diameter tolerance of 6H.



- Product Finder
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### 2.17 Recommended tap drill sizes for cold-forming internal threads

## American Standard Threads



## UNC

Unified coarse thread ASME B1.1 (Tol. 2B)

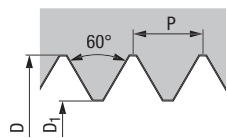
Nominal Size	P [T.P.I.]	Rec. tap drill size	
		[mm]	[inch]
D			
No. 1	64		0.0670
No. 2	56		0.0787
No. 3	48		0.0906
No. 4	40		0.1004
No. 5	40		0.1142
No. 6	32		0.1240
No. 8	32		0.1496
No. 10	24		0.1713
No. 12	24		0.1969
1/4	20		0.2264
5/16	18		0.2874
3/8	16		0.3465
7/16	14		0.4035
1/2	13		0.4646
9/16	12		0.5236
5/8	11		0.5827
3/4	10		0.7028
7/8	9		0.8228
1	8		0.9409

## UNF

Unified fine thread ASME B1.1 (Tol. 2B)

Nominal Size	P [T.P.I.]	Rec. tap drill size	
		[mm]	[inch]
D			
No. 0	80		0.0551
No. 1	72		0.0669
No. 2	64		0.0795
No. 3	56		0.0913
No. 4	48		0.1031
No. 5	44		0.1150
No. 6	40		0.1268
No. 8	36		0.1516
No. 10	32		0.1752
No. 12	28		0.2008
1/4	28		0.2343
5/16	24		0.2933
3/8	24		0.3563
7/16	20		0.4154
1/2	20		0.4783
9/16	18		0.5374
5/8	18		0.6004
3/4	16		0.7224
7/8	14		0.8425
1	12		0.9626

## ISO Metric Threads



## M

ISO Metric coarse thread DIN 13 (Tol. 6H)

Nominal Size	P [mm]	Rec. tap drill size	
		[mm]	[inch]
D			
M 2	0.4	1.85	0.0728
M 2.5	0.45	2.33	0.0917
M 3	0.5	2.8	0.1102
M 3.5	0.6	3.25	0.1280
M 4	0.7	3.7	0.1457
M 4.5	0.75	4.2	0.1654
M 5	0.8	4.65	0.1831
M 6	1	5.6	0.2205
M 7	1	6.6	0.2598
M 8	1.25	7.45	0.2933
M 10	1.5	9.35	0.3681
M 12	1.75	11.25	0.4429
M 14	2	13.1	0.5157
M 16	2	15.1	0.5945
M 18	2.5	16.85	0.6634
M 20	2.5	18.85	0.7421
M 22	2.5	20.85	0.8209
M 24	3	22.65	0.8917

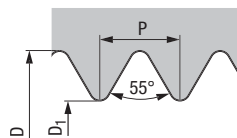
## MF

ISO Metric fine thread DIN 13 (Tol. 6H)

Nominal Size	P [mm]	Rec. tap drill size	
		[mm]	[inch]
D			
M 4 x 0.5		3.8	0.1496
M 5 x 0.5		4.8	0.1890
M 6 x 0.75		5.7	0.2244
M 8 x 0.75		7.7	0.3031
M 8 x 1		7.6	0.2992
M 10 x 1		9.6	0.3780
M 10 x 1.25		9.45	0.3720
M 12 x 1.5		11.35	0.4469
M 14 x 1.5		13.35	0.5256
M 16 x 1.5		15.35	0.6043
M 18 x 1.5		17.35	0.6831
M 20 x 1.5		19.35	0.7618
M 22 x 1.5		21.35	0.8406
M 24 x 1.5		23.35	0.9193

Tap drill sizes of Metric fine threads which are not listed can be found by considering the diameter difference.

## Straight Pipe Threads

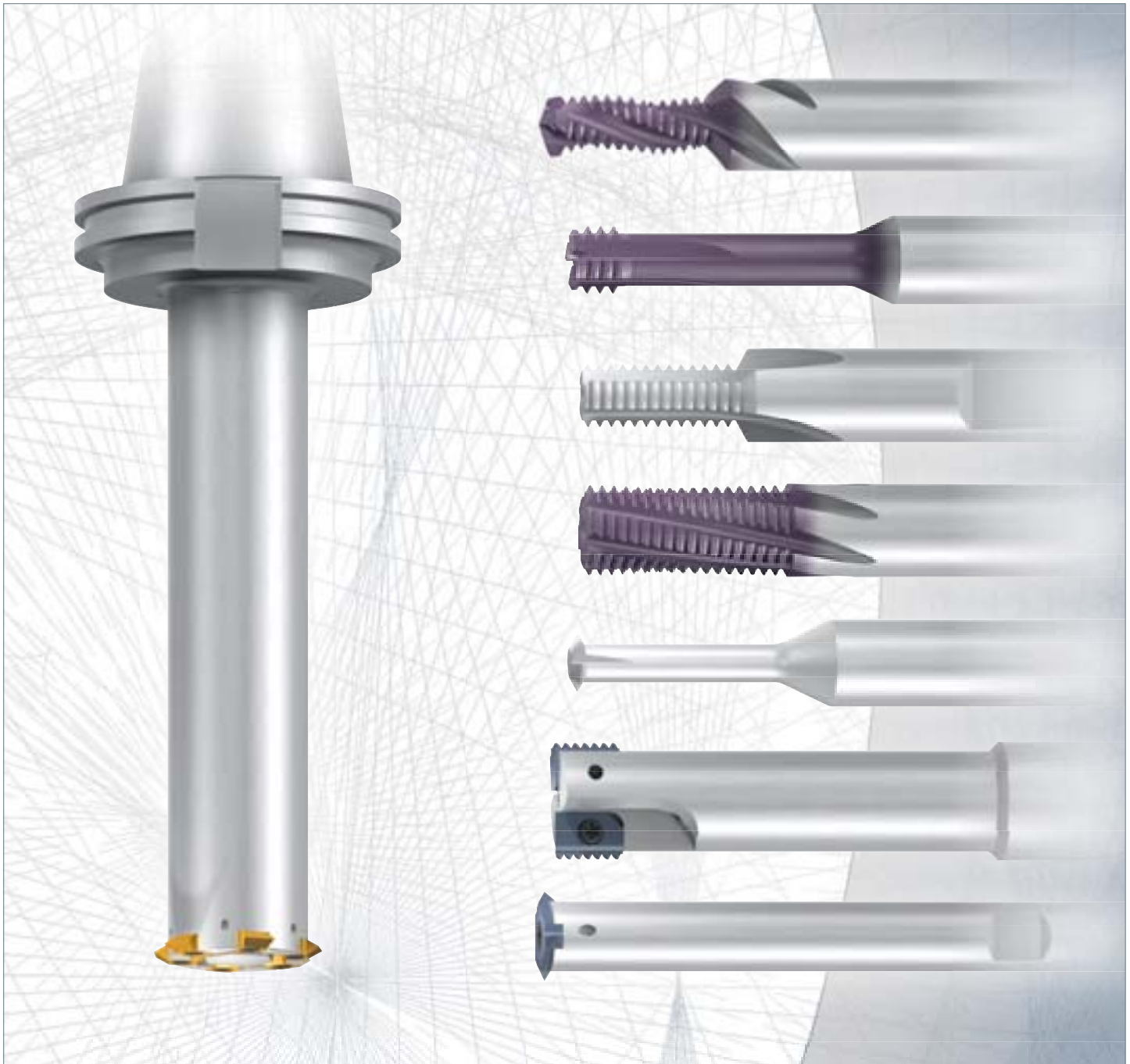


## G

Whitworth pipe thread DIN EN ISO 228

Nominal Size	P [T.P.I.]	Rec. tap drill size	
		[mm]	[inch]
D			
G 1/16	28	7.25	0.2854
G 1/8	28	9.25	0.3642
G 1/4	19	12.55	0.4941
G 3/8	19	16.05	0.6319
G 1/2	14	20.1	0.7913
G 5/8	14	22.05	0.8681
G 3/4	14	25.6	1.0079
G 7/8	14	29.35	1.1555
G 1	11	32.15	1.2657





## Thread Mills



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Product finder and cutting data	186 - 189
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Product Finder

V<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

ZGF(I)

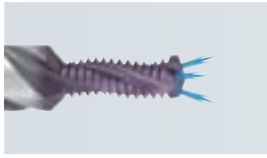
CIRC-GF

Gigant

MoSys



### BGF

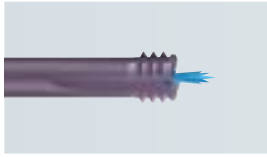


#### Solid Carbide Drill Thread Mills

- For the complete machining of thread hole, chamfer and thread in one work process
- With corrected thread profile (for one single thread size only)

191 - 197

### ZBGF

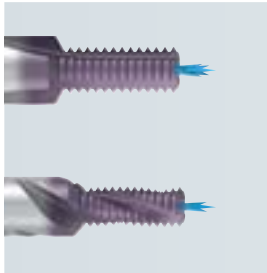


#### Solid Carbide Circular Drill Thread Mills

- For the machining of thread hole and thread in one work process
- With corrected thread profile (for different thread sizes, but for one pitch only)

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### GSF, GSF Aero

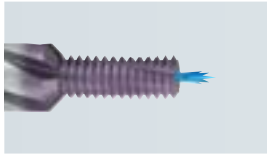


#### Solid Carbide Thread Milling Cutters with Countersinking Step

- For the machining of countersunk edge and thread in one work process
- With corrected thread profile (for one single thread size only)

207 - 217

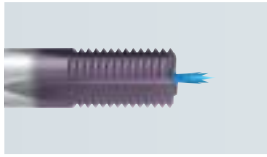
### GSF-Z



#### Solid Carbide Thread Milling Cutters with Countersinking Step

- For the machining of countersunk edge and thread in one work process
- With corrected thread profile (for one single thread size only)
- Increased number of flutes
- Optimized cutting geometry

### GF, GFI



#### Solid Carbide Thread Milling Cutters

- With standard thread profile (for different thread sizes, but for one pitch only)

### GF-Z



#### Solid Carbide Thread Milling Cutters

- With standard thread profile (for different thread sizes, but for one pitch only)
- Increased number of flutes
- Optimized cutting geometry

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### GF-Vario-Z



#### Solid Carbide Thread Milling Cutters, Variable

- With corrected thread profile (for different thread sizes, but for one pitch only)
- Increased number of flutes
- Optimized cutting geometry

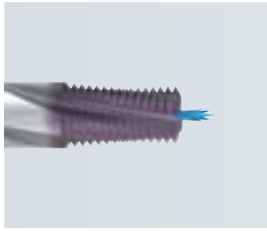
### GF-H



#### Solid Carbide Thread Milling Cutters for Hard Machining

- With corrected thread profile (for one single thread size only)

**GF-KEG, GFI-KEG**

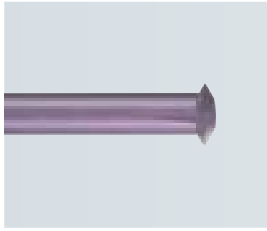


**Solid Carbide Thread Milling Cutters for Tapered Threads**

- With corrected thread profile (for one single thread size, resp. for one pitch only)

235 - 241

**ZGF, ZGFI**

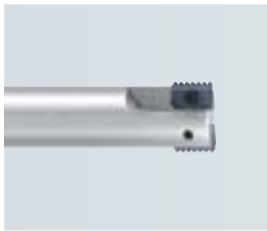


**Solid Carbide Circular Thread Milling Cutters**

- With corrected thread profile (for different thread sizes and pitches)
- For the machining of threads from M 1

243 - 247

**CIRC-GF**



**Circular Thread Milling Bodies**

- With one or two multi-tooth inserts (for different thread sizes, but for one pitch only)

249 - 253

**CIRC-GF**



**Circular Thread Milling Bodies**

- With infeed indexable insert "3-tooth" (for different thread sizes and pitches)

**Gigant**

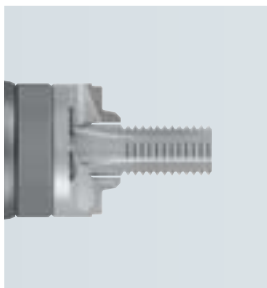


**Circular Thread Milling Bodies**

- Specially made for large thread sizes
- With up to ten 4-tooth indexable inserts (for different thread sizes and pitches)

255 - 269

**MoSys**



**Counterbore and Stepped Bore System for Free Combination**

- For the complete machining of thread hole, thread and spot face

272 - 274

- [v<sub>c</sub>](#)
- [UNC](#)
- [UNF](#)
- [UN](#)
- [M](#)
- [MF](#)
- [NPSF](#)
- [G](#)
- [Rp \(BSPP\)](#)
- [W](#)
- [BSW, BSF](#)
- [PPT](#)
- [NPTF](#)
- [Rc \(BSPT\)](#)
- [STI](#)
- [SELF-LOCK](#)
- [Accessories](#)
- [Tech. Info](#)
- [BGF](#)
- [ZBGF](#)
- [GSF \(Aero\)](#)
- [GSF-Z](#)
- [GF\(I\), GF-Z](#)
- [GF-Vario-Z](#)
- [GF-H](#)
- [GF\(I\)-KEG](#)
- [ZGF\(I\)](#)
- [CIRC-GF](#)
- [Gigant](#)
- [MoSys](#)



## Product finder and cutting data



**Please note:**

The cutting values listed in the respective columns are standard values which have to be adjusted to individual work conditions (material, lubrication, machine etc.).

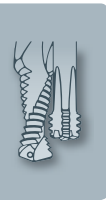
The suitability is marked as follows:

- Preferred suitable thread mill
- Suitable thread mill

- v<sub>c</sub> = Cutting speed [SFM]
- f<sub>z</sub> = Feed per tooth [inch]
- f<sub>b</sub> = Drilling feed [inch/rev.]

Application – Material		Hardness Range			Material Examples
		HRC	BHN	N/mm <sup>2</sup>	
P	<b>Steel materials</b>				
	1.1 Cold-extrusion steels, Construction steels, Free-cutting steels, etc.		≤ 180	≤ 600	1010 / 1018 / 1020 / 12L14 / 12L15 / A36 / T1
	2.1 Construction steels, Cementation steels, Steel castings, etc.	≤ 22	≤ 235	≤ 800	A36 / T1 / 1030-1095 / 4140 / 4340 / 8620
	3.1 Cementation steels, Heat-treatable steels, Cold work steels, etc.	≤ 31	≤ 295	≤ 1000	4140 / 4340 / 8620 / P20 / H13 / D2 / A2 / S7 / H1150
	4.1 Heat-treatable steels, Cold work steels, Nitriding steels, etc.	≤ 38	≤ 355	≤ 1200	4140 / 4340 / 8620 / P20 / H13 / D2 / 300M / 52100 / M1-M42
5.1 High-alloyed steels, Cold work steels, Hot work steels, etc.	≤ 44	≤ 415	≤ 1400	4140 / 4340 / 8620 / P20 / H13 / D2 / 300M / 52100	
M	<b>Stainless steel materials</b>				
	1.1 Ferritic, martensitic	≤ 29	≤ 280	≤ 950	410 / 440 / 440C / 17-4 PH
	2.1 Austenitic	≤ 29	≤ 280	≤ 950	303 / 304 / 316 / 316L / 321
	3.1 Austenitic-ferritic (Duplex)	≤ 35	≤ 325	≤ 1100	
	4.1 Austenitic-ferritic heat-resistant (Super Duplex)	≤ 39	≤ 370	≤ 1250	
K	<b>Cast materials</b>				
	1.1 Cast iron with lamellar graphite (GJL)		30 - 75	100 - 250	Grey cast irons G10-GG40
	1.2		75 - 135	250 - 450	
	2.1 Cast iron with nodular graphite (GJS)		105 - 150	350 - 500	Nodular GGG40-GGG70
	2.2		150 - 265	500 - 900	
	3.1 Cast iron with vermicular graphite (GJV)		90 - 120	300 - 400	Compact graphite iron (CGI)
	3.2		120 - 150	400 - 500	
	4.1 Malleable cast iron (GTMW, GTMB)		70 - 145	250 - 500	
4.2		150 - 235	500 - 800	White iron	
N	<b>Non ferrous materials</b>				
	<b>Aluminium alloys</b>				
	1.1 Aluminium wrought alloys		≤ 60	≤ 200	7075
	1.2		≤ 105	≤ 350	6061-T6 / 2024-T4
	1.3		≤ 165	≤ 550	
	1.4 Aluminium cast alloys Si ≤ 7%				
	1.5 Aluminium cast alloys 7% < Si ≤ 12%				
	1.6 Aluminium cast alloys 12% < Si ≤ 17%				
	<b>Copper alloys</b>				
	2.1 Pure copper, low-alloyed copper		≤ 120	≤ 400	
	2.2 Copper-zinc alloys (brass, long-chipping)		≤ 165	≤ 550	
	2.3 Copper-zinc alloys (brass, short-chipping)		≤ 165	≤ 550	
	2.4 Copper-aluminium alloys (alu bronze, long-chipping)		≤ 235	≤ 800	
	2.5 Copper-tin alloys (tin bronze, long-chipping)		≤ 205	≤ 700	
	2.6 Copper-tin alloys (tin bronze, short-chipping)		≤ 120	≤ 400	
	2.7 Special copper alloys		≤ 180	≤ 600	
	2.8	≤ 44	≤ 415	≤ 1400	
	<b>Magnesium alloys</b>				
	3.1 Magnesium wrought alloys		≤ 150	≤ 500	
	3.2 Magnesium cast alloys		≤ 150	≤ 500	
<b>Synthetics</b>					
4.1 Duroplastics (short-chipping)					
4.2 Thermoplastics (long-chipping)					
4.3 Fibre-reinforced synthetics (fibre content ≤ 30%)					
4.4 Fibre-reinforced synthetics (fibre content > 30%)					
<b>Special materials</b>					
5.1 Graphite					
5.2 Tungsten-copper alloys					
5.3 Composite materials					
S	<b>Special materials</b>				
	<b>Titanium alloys</b>				
	1.1 Pure titanium		≤ 135	≤ 450	CP1 / CP2
	1.2 Titanium alloys	≤ 27	≤ 265	≤ 900	6AL4V
	1.3	≤ 39	≤ 370	≤ 1250	
	<b>Nickel alloys, cobalt alloys and iron alloys</b>				
	2.1 Pure nickel		≤ 180	≤ 600	
	2.2 Nickel-base alloys	≤ 31	≤ 295	≤ 1000	Monel 500
	2.3	≤ 49	≤ 475	≤ 1600	718 Inconel
	2.4 Cobalt-base alloys	≤ 31	≤ 295	≤ 1000	
	2.5	≤ 49	≤ 475	≤ 1600	Haynes 25
	2.6 Iron-base alloys	≤ 46	≤ 445	≤ 1500	Incoloy 925
H	<b>Hard materials</b>				
	1.1 High strength steels, hardened steels, hard castings	44 - 50			
	1.2	50 - 55			
	1.3	55 - 60			
	1.4	60 - 63			
	1.5	63 - 66			





BGF-Z2



BGF-Z3

	V <sub>c</sub>		V <sub>c</sub>		f <sub>b</sub>		f <sub>z</sub>		
	Uncoated	TICN	Uncoated	TICN	ø d <sub>1</sub> ≤ 0.3150	ø d <sub>1</sub> > 0.3150	ø d <sub>1</sub> ≤ 0.3150	ø d <sub>1</sub> > 0.3150	
<b>P</b>	1.1								
	2.1								
	3.1								
	4.1								
	5.1								
<b>M</b>	1.1								
	2.1								
	3.1								
	4.1								
<b>K</b>	1.1	262 - 459	<b>262 - 525</b>	262 - 459	<b>262 - 525</b>	.0039 - .0098	.0079 - .0157	.0016 - .0028	.0020 - .0047
	1.2	262 - 459	<b>262 - 525</b>	262 - 459	<b>262 - 525</b>	.0039 - .0098	.0079 - .0157	.0016 - .0028	.0020 - .0047
	2.1	262 - 459	<b>262 - 525</b>			.0039 - .0059	.0059 - .0098	.0016 - .0028	.0020 - .0047
	2.2	262 - 459	<b>262 - 525</b>			.0039 - .0059	.0059 - .0098	.0016 - .0028	.0020 - .0047
	3.1	262 - 459	<b>262 - 525</b>			.0039 - .0098	.0079 - .0157	.0016 - .0028	.0020 - .0047
	3.2	262 - 459	<b>262 - 525</b>			.0039 - .0098	.0079 - .0157	.0016 - .0028	.0020 - .0047
	4.1								
4.2									
<b>N</b>	1.1	<b>328 - 820</b>	492 - 820			.0031 - .0059	.0059 - .0098	.0016 - .0031	.0028 - .0059
	1.2	<b>328 - 820</b>	492 - 820			.0031 - .0059	.0059 - .0098	.0016 - .0031	.0028 - .0059
	1.3	<b>328 - 820</b>	492 - 820			.0031 - .0059	.0059 - .0098	.0016 - .0031	.0028 - .0059
	1.4	<b>328 - 820</b>	492 - 1312			.0059 - .0098	.0079 - .0157	.0016 - .0031	.0028 - .0059
	1.5	328 - 820	<b>492 - 1312</b>	328 - 820	<b>492 - 1312</b>	.0059 - .0098	.0079 - .0157	.0016 - .0031	.0028 - .0059
	1.6		<b>328 - 656</b>		<b>328 - 656</b>	.0059 - .0098	.0079 - .0157	.0016 - .0031	.0028 - .0059
	2.1								
	2.2	328 - 820	492 - 1312			.0039 - .0079	.0059 - .0118	.0020 - .0031	.0028 - .0059
	2.3	328 - 820	492 - 1312	328 - 820	492 - 1312	.0039 - .0079	.0059 - .0118	.0020 - .0031	.0028 - .0059
	2.4								
	2.5								
	2.6	262 - 656	328 - 820			.0039 - .0098	.0079 - .0157	.0016 - .0028	.0020 - .0047
	2.7								
	2.8								
	3.1	328 - 820	<b>492 - 1312</b>			.0039 - .0079	.0059 - .0118	.0016 - .0031	.0028 - .0059
	3.2	328 - 820	<b>492 - 1312</b>			.0059 - .0118	.0079 - .0157	.0016 - .0031	.0028 - .0059
4.1	197 - 492	328 - 1312			.0059 - .0118	.0079 - .0157	.0020 - .0039	.0031 - .0079	
4.2									
4.3									
4.4									
5.1									
5.2									
5.3									
<b>S</b>	1.1								
	1.2								
	1.3								
	2.1								
	2.2								
	2.6								
<b>H</b>	1.1								
	1.2								
	1.3								
	1.4								
	1.5								

ZBGF-T



ZBGF-H



ZBGF-W



Gigant



V <sub>C</sub> Coated		f <sub>Z</sub>	V <sub>C</sub> Coated		f <sub>Z</sub>	V <sub>C</sub> Coated		f <sub>Z</sub>	V <sub>C</sub> Coated		f <sub>Z</sub>
							<b>492 - 820</b>	.0016 - .0031	<b>820 - 1640</b>	.0059 - .0098	<b>1.1</b>
							<b>492 - 820</b>	.0016 - .0031	<b>820 - 1640</b>	.0059 - .0098	<b>2.1</b>
							<b>328 - 820</b>	.0012 - .0031	<b>492 - 820</b>	.0039 - .0059	<b>3.1</b>
							328 - 820	.0012 - .0031	<b>492 - 820</b>	.0039 - .0059	<b>4.1</b>
							328 - 656	.0008 - .0024	<b>492 - 820</b>	.0039 - .0059	<b>5.1</b>
							<b>328 - 591</b>	.0008 - .0020	<b>262 - 492</b>	.0039 - .0059	<b>1.1</b>
							<b>328 - 591</b>	.0008 - .0020	<b>262 - 492</b>	.0039 - .0059	<b>2.1</b>
							197 - 394	.0008 - .0016	<b>197 - 394</b>	.0031 - .0047	<b>3.1</b>
							197 - 394	.0008 - .0016	197 - 394	.0031 - .0047	<b>4.1</b>
<b>656 - 984</b>	.0016 - .0047					<b>656 - 984</b>	.0016 - .0039		<b>591 - 1312</b>	.0059 - .0098	<b>1.1</b>
<b>656 - 984</b>	.0016 - .0047					<b>656 - 984</b>	.0016 - .0039		<b>591 - 1312</b>	.0059 - .0098	<b>1.2</b>
						<b>492 - 820</b>	.0020 - .0031		<b>591 - 1312</b>	.0059 - .0098	<b>2.1</b>
						<b>492 - 820</b>	.0020 - .0031		<b>591 - 1312</b>	.0059 - .0098	<b>2.2</b>
						<b>492 - 820</b>	.0020 - .0031		<b>492 - 820</b>	.0039 - .0059	<b>3.1</b>
						<b>492 - 820</b>	.0020 - .0031		<b>492 - 820</b>	.0039 - .0059	<b>3.2</b>
						<b>656 - 984</b>	.0020 - .0039		<b>591 - 1312</b>	.0059 - .0098	<b>4.1</b>
						<b>656 - 984</b>	.0020 - .0039		<b>591 - 1312</b>	.0059 - .0098	<b>4.2</b>
656 - 984	.0016 - .0031					<b>656 - 984</b>	.0020 - .0039		<b>1312 - 1640</b>	.0059 - .0118	<b>1.1</b>
656 - 984	.0016 - .0031					<b>656 - 984</b>	.0020 - .0039		<b>1312 - 1640</b>	.0059 - .0118	<b>1.2</b>
656 - 984	.0016 - .0031					<b>656 - 984</b>	.0020 - .0039		<b>1312 - 1640</b>	.0059 - .0118	<b>1.3</b>
656 - 984	.0016 - .0031					<b>656 - 984</b>	.0020 - .0039		<b>1312 - 1640</b>	.0059 - .0118	<b>1.4</b>
<b>656 - 984</b>	.0016 - .0039					<b>656 - 984</b>	.0020 - .0039		<b>1312 - 1640</b>	.0059 - .0118	<b>1.5</b>
<b>328 - 656</b>	.0016 - .0039					328 - 656	.0020 - .0039		<b>492 - 820</b>	.0059 - .0118	<b>1.6</b>
						<b>328 - 591</b>	.0012 - .0020		<b>820 - 1640</b>	.0059 - .0098	<b>2.1</b>
						<b>492 - 820</b>	.0020 - .0031		<b>820 - 1640</b>	.0059 - .0098	<b>2.2</b>
						<b>656 - 984</b>	.0020 - .0039		<b>820 - 1640</b>	.0059 - .0098	<b>2.3</b>
						<b>328 - 591</b>	.0012 - .0020		<b>492 - 820</b>	.0039 - .0098	<b>2.4</b>
						<b>328 - 591</b>	.0012 - .0020		<b>492 - 820</b>	.0039 - .0098	<b>2.5</b>
						<b>656 - 984</b>	.0020 - .0039		<b>492 - 820</b>	.0039 - .0098	<b>2.6</b>
			131 - 197	.0008 - .0016					<b>262 - 492</b>	.0039 - .0059	<b>2.7</b>
			131 - 197	.0008 - .0016					<b>262 - 492</b>	.0039 - .0059	<b>2.8</b>
<b>656 - 984</b>	.0016 - .0039					656 - 984	.0020 - .0039		<b>1312 - 1640</b>	.0059 - .0118	<b>3.1</b>
<b>656 - 984</b>	.0016 - .0039					656 - 984	.0020 - .0039		<b>1312 - 1640</b>	.0059 - .0118	<b>3.2</b>
						<b>492 - 820</b>	.0020 - .0031		<b>591 - 1312</b>	.0059 - .0098	<b>4.1</b>
									<b>591 - 1312</b>	.0059 - .0098	<b>4.2</b>
						262 - 492	.0020 - .0031		<b>262 - 492</b>	.0059 - .0098	<b>4.3</b>
						262 - 492	.0020 - .0031		<b>262 - 492</b>	.0059 - .0098	<b>4.4</b>
											<b>5.1</b>
											<b>5.2</b>
											<b>5.3</b>
											<b>1.1</b>
									<b>197 - 394</b>	.0031 - .0047	<b>1.2</b>
									<b>197 - 394</b>	.0031 - .0047	<b>1.3</b>
									<b>197 - 394</b>	.0031 - .0047	<b>1.3</b>
											<b>2.1</b>
											<b>2.2</b>
											<b>2.3</b>
											<b>2.4</b>
											<b>2.5</b>
											<b>2.6</b>
			197 - 328	.0012 - .0024		197 - 328	.0008 - .0024				<b>1.1</b>
			197 - 328	.0012 - .0024		197 - 328	.0008 - .0024				<b>1.2</b>
			<b>131 - 230</b>	.0008 - .0016							<b>1.3</b>
			<b>98 - 197</b>	.0008 - .0016							<b>1.4</b>
			<b>98 - 197</b>	.0008 - .0016							<b>1.5</b>



Product  
Finder

V<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

ZGF(I)

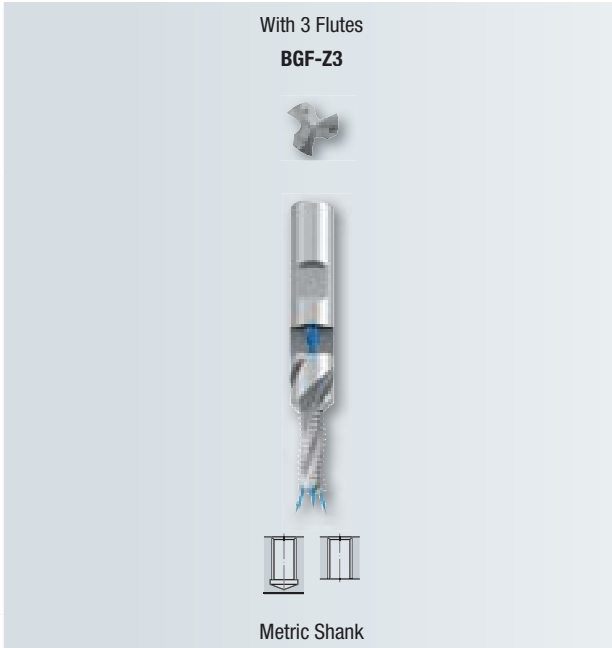
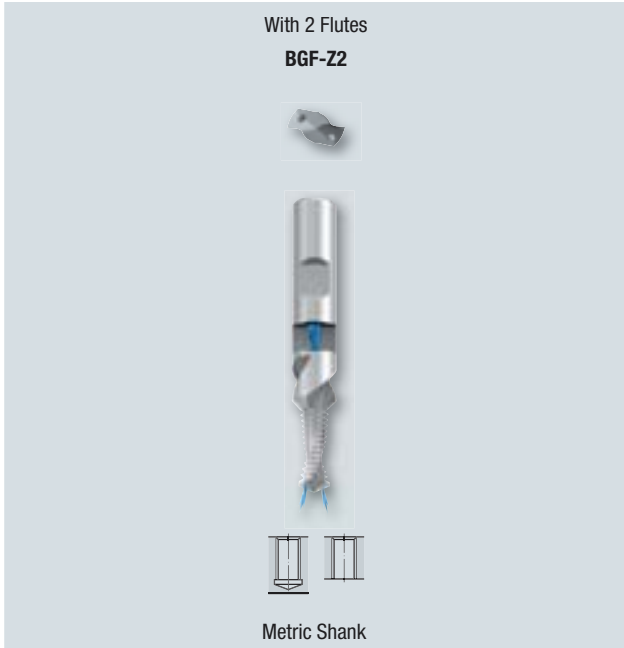
CIRC-GF

Gigant

MoSys







Page

192		<b>UNC</b>
193		<b>UNF</b>
194	195	<b>M</b>
196		<b>MF</b>
197		<b>STI-M</b>

Product Finder

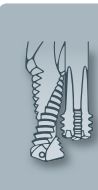
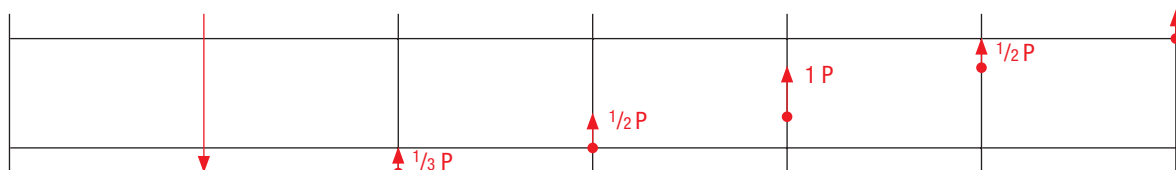
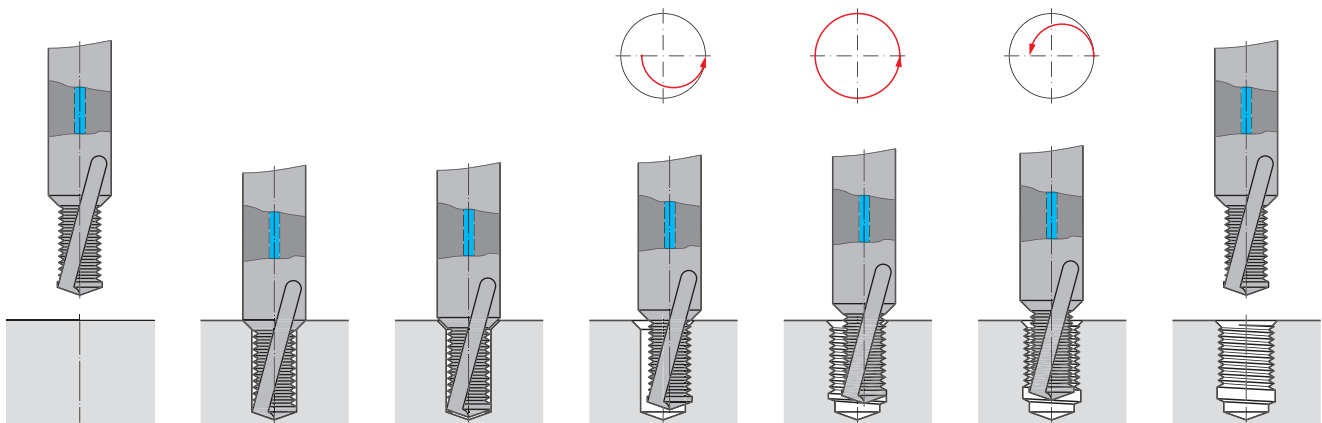
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF**
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

**Possible modifications**



For a description of these modifications, see page 279

**Thread milling cycle**







- Product Finder
- Vc
- UNC
- UNF
- UN
- M**
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### Metric Shank

Carbide

R30

RH + LH

2 Flutes

DIN 6535

HB  
HE  
HA



TICN

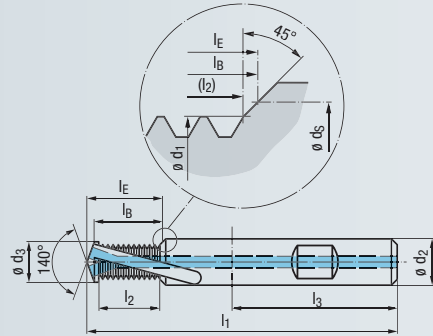
Range of Application

**K 1.1-3.2**  
**N 1.1-5, 2.2-3, 2.6, 3.1-2, 4.1**

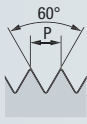
**K 1.1-3.2**  
**N 1.1-6, 2.2-3, 2.6, 3.1-2, 4.1**

Thread Depth

### 1.5 x D



# M



ISO Metric coarse thread  
DIN 13

#### Tool Identification

Nominal Size												Dimens. ID	GF422201	GF422206
Ø D	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	Ø d <sub>1</sub>	mm Ø d <sub>3</sub>	Ø d <sub>5</sub>	l <sub>B</sub>	l <sub>E</sub>	Ø d <sub>2</sub>	BGF-VHM-Z2 1.5xD R30-1KZ-HB		BGF-VHM-Z2 1.5xD R30-1KZ-HB TICN	
M 4	0.7	49	5.64	36	3.16	3.3	4.3	6.8	7.4	6	.0040	●	●	
M 5	0.8	55	7.25	36	4.04	4.2	5.3	8.6	9.4	6	.0050	●	●	
M 6	1	62	9.06	36	4.8	5	6.3	10.7	11.6	8	.0060	●	●	
M 8	1.25	74	11.33	40	6.5	6.75	8.3	13.4	14.6	10	.0080	●	●	
M 10	1.5	79	15.09	45	8.2	8.5	10.3	17.5	19.1	12	.0100	●	●	
M 12	1.75	89	17.61	45	9.9	10.25	12.3	20.4	22.3	14	.0112	●	●	
M 16	2	102	24.13	48	13.6	14	16.3	27.3	29.9	18	.0116	●	●	

Thread Depth

### 2 x D

#### Tool Identification

Nominal Size												Dimens. ID	GF432201	GF432206
Ø D	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	Ø d <sub>1</sub>	mm Ø d <sub>3</sub>	Ø d <sub>5</sub>	l <sub>B</sub>	l <sub>E</sub>	Ø d <sub>2</sub>	BGF-VHM-Z2 2xD R30-1KZ-HB		BGF-VHM-Z2 2xD R30-1KZ-HB TICN	
M 4	0.7	49	7.74	36	3.16	3.3	4.3	8.9	9.5	6	.0040	●	●	
M 5	0.8	55	9.65	36	4.04	4.2	5.3	11	11.8	6	.0050	●	●	
M 6	1	62	12.06	36	4.8	5	6.3	13.7	14.6	8	.0060	●	●	
M 8	1.25	74	15.08	40	6.5	6.75	8.3	17.1	18.3	10	.0080	●	●	
M 10	1.5	79	19.59	45	8.2	8.5	10.3	22	23.6	12	.0100	●	●	
M 12	1.75	89	22.86	45	9.9	10.25	12.3	25.7	27.5	14	.0112	●	●	
M 16	2	102	32.13	48	13.6	14	16.3	35.3	37.9	18	.0116	●	●	

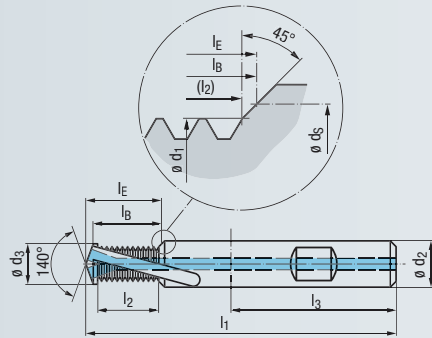
Thread Depth

### 2.5 x D

#### Tool Identification

Nominal Size												Dimens. ID	GF442201	GF442206
Ø D	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	Ø d <sub>1</sub>	mm Ø d <sub>3</sub>	Ø d <sub>5</sub>	l <sub>B</sub>	l <sub>E</sub>	Ø d <sub>2</sub>	BGF-VHM-Z2 2.5xD R30-1KZ-HB		BGF-VHM-Z2 2.5xD R30-1KZ-HB TICN	
M 6	1	65	15.10	36	4.8	5	6.3	16.7	17.6	8	.0060	●	●	
M 8	1.25	80	20.08	40	6.5	6.75	8.3	22.1	23.3	10	.0080	●	●	
M 10	1.5	85	25.59	45	8.2	8.5	10.3	28	29.6	12	.0100	●	●	
M 12	1.75	95	29.86	45	9.9	10.25	12.3	32.7	34.5	14	.0112	●	●	
M 16	2	110	40.13	48	13.6	14	16.3	43.3	45.9	18	.0116	●	●	

**Metric Shank**



Carbide

R30

RH + LH

3 Flutes



DIN 6535



Coating

TiCN

Range of Application

K 1.1-2  
N 1.5, 2,3

K 1.1-2  
N 1.5-6, 2,3

Thread Depth

**1.5 x D**

**Tool Identification**

Nominal Size		P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm		l <sub>B</sub>	l <sub>E</sub>	ø d <sub>2</sub>	Dimens. ID
ø D	mm					ø d <sub>1</sub>	ø d <sub>3</sub>				
M 6	1	62	9.06	36	4.8	5	6.3	10.7	11.6	8	.0060
M 8	1.25	74	11.33	40	6.5	6.75	8.3	13.4	14.6	10	.0080
M 10	1.5	79	15.09	45	8.2	8.5	10.3	17.5	19.1	12	.0100
M 12	1.75	89	17.61	45	9.9	10.25	12.3	20.4	22.3	14	.0112
M 16	2	102	24.13	48	13.6	14	16.3	27.3	29.9	18	.0116

GF422251

BGF-VHM-Z3  
1.5xD  
R30-IKZ-HB

GF422256

BGF-VHM-Z3  
1.5xD  
R30-IKZ-HB  
TiCN

Thread Depth

**2 x D**

**Tool Identification**

Nominal Size		P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm		l <sub>B</sub>	l <sub>E</sub>	ø d <sub>2</sub>	Dimens. ID
ø D	mm					ø d <sub>1</sub>	ø d <sub>3</sub>				
M 6	1	62	12.06	36	4.8	5	6.3	13.7	14.6	8	.0060
M 8	1.25	74	15.08	40	6.5	6.75	8.3	17.1	18.3	10	.0080
M 10	1.5	79	19.59	45	8.2	8.5	10.3	22	23.6	12	.0100
M 12	1.75	89	22.86	45	9.9	10.25	12.3	25.7	27.5	14	.0112
M 16	2	102	32.13	48	13.6	14	16.3	35.3	37.9	18	.0116

GF432251

BGF-VHM-Z3  
2xD  
R30-IKZ-HB

GF432256

BGF-VHM-Z3  
2xD  
R30-IKZ-HB  
TiCN

Thread Depth

**2.5 x D**

**Tool Identification**

Nominal Size		P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm		l <sub>B</sub>	l <sub>E</sub>	ø d <sub>2</sub>	Dimens. ID
ø D	mm					ø d <sub>1</sub>	ø d <sub>3</sub>				
M 6	1	65	15.10	36	4.8	5	6.3	16.7	17.6	8	.0060
M 8	1.25	80	20.08	40	6.5	6.75	8.3	22.1	23.3	10	.0080
M 10	1.5	85	25.59	45	8.2	8.5	10.3	28	29.6	12	.0100
M 12	1.75	95	29.86	45	9.9	10.25	12.3	32.7	34.5	14	.0112
M 16	2	110	40.13	48	13.6	14	16.3	43.3	45.9	18	.0116

GF442251

BGF-VHM-Z3  
2.5xD  
R30-IKZ-HB

GF442256

BGF-VHM-Z3  
2.5xD  
R30-IKZ-HB  
TiCN



- Product Finder
- Vc
- UNC
- UNF
- UN
- M
- MF**
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### Metric Shank

Carbide

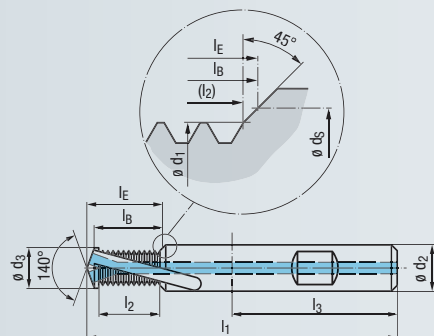
R30

RH + LH

2 Flutes

DIN 6535

HB  
HE  
HA



Coating

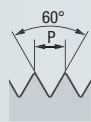
TiCN

Range of Application

**K 1.1-3.2**  
**N 1.1-5, 2.2-3, 2.6, 3.1-2, 4.1**

**K 1.1-3.2**  
**N 1.1-6, 2.2-3, 2.6, 3.1-2, 4.1**

# MF



ISO Metric fine thread  
DIN 13

Thread Depth

## 1.5 x D

#### Tool Identification

GF422201

GF422206

Nominal Size	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	d <sub>1</sub> mm	d <sub>3</sub> mm	d <sub>5</sub> mm	l <sub>B</sub>	l <sub>E</sub>	d <sub>2</sub> mm	Dimens. ID	BGF-VHM-Z2 1.5xD R30-1KZ-HB	BGF-VHM-Z2 1.5xD R30-1KZ-HB TiCN
M 4 x 0.5	49	5.05	36	3.36	3.5	4.3	7	7.6	6	.0210			
M 5 x 0.5	55	7.56	36	4.34	4.5	5.3	8.5	9.3	6	.0218			
M 6 x 0.75	62	9.07	36	5.05	5.25	6.3	10.4	11.3	8	.0229			
M 8 x 1	74	12.09	40	6.75	7	8.3	13.8	15	10	.0251			
M 10 x 1	79	15.11	45	8.7	9	10.3	16.8	18.4	12	.0276	•	•	
M 12 x 1	89	17.14	45	10.65	11	12.3	18.8	20.8	14	.0301			
M 12 x 1.5	89	18.12	45	10.15	10.5	12.3	20.5	22.5	14	.0303	•	•	
M 14 x 1.5	102	21.14	48	12.1	12.5	14.3	23.6	25.8	16	.0331	•	•	
M 16 x 1.5	102	24.15	48	14.1	14.5	16.3	26.6	29.2	18	.0359	•	•	

Thread Depth

## 2 x D

#### Tool Identification

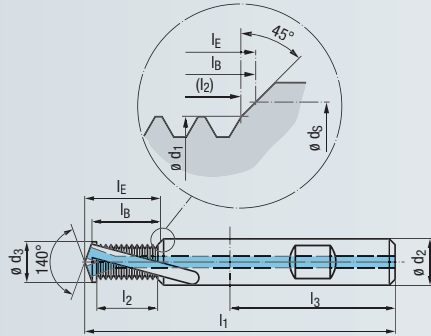
GF432201

GF432206

Nominal Size	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	d <sub>1</sub> mm	d <sub>3</sub> mm	d <sub>5</sub> mm	l <sub>B</sub>	l <sub>E</sub>	d <sub>2</sub> mm	Dimens. ID	BGF-VHM-Z2 2xD R30-1KZ-HB	BGF-VHM-Z2 2xD R30-1KZ-HB TiCN
M 4 x 0.5	49	8.05	36	3.36	3.5	4.3	9	9.6	6	.0210			
M 5 x 0.5	55	10.06	36	4.34	4.5	5.3	11	11.8	6	.0218			
M 6 x 0.75	62	12.07	36	5.05	5.25	6.3	13.4	14.3	8	.0229	•	•	
M 8 x 1	74	16.09	40	6.75	7	8.3	17.8	19	10	.0251	•	•	
M 10 x 1	79	20.11	45	8.7	9	10.3	21.8	23.4	12	.0276	•	•	
M 12 x 1	89	24.14	45	10.65	11	12.3	25.8	27.8	14	.0301			
M 12 x 1.5	89	24.12	45	10.15	10.5	12.3	26.5	28.5	14	.0303	•	•	
M 14 x 1.5	102	27.14	48	12.1	12.5	14.3	29.6	31.8	16	.0331	•	•	
M 16 x 1.5	102	31.65	48	14.1	14.5	16.3	34.1	36.7	18	.0359	•	•	

Other sizes upon request

**Metric Shank**



**STI-M**  
ISO Metric coarse thread DIN 8140-2  
for wire thread inserts



Carbide

R30

RH + LH

2 Flutes

DIN 6535

HB  
HE  
HA

90°

ø D



Coating

TICN

Range of Application

**K 1.1-3.2**  
**N 1.1-5, 2.2-3, 2.6, 3.1-2, 4.1**

**K 1.1-3.2**  
**N 1.1-6, 2.2-3, 2.6, 3.1-2, 4.1**

Thread Depth

**1.5 x D**

**Tool Identification**

											GF422201		GF422206	
											BGF-VHM-Z2 1.5xD R30-IKZ-HB		BGF-VHM-Z2 1.5xD R30-IKZ-HB TICN	
Nominal Size ø D	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	ø d <sub>1</sub>	mm ø d <sub>3</sub>	ø d <sub>5</sub>	l <sub>B</sub>	l <sub>E</sub>	ø d <sub>2</sub>	Dimens. ID			
STI-M 6	1	74	10.10	40	6	6.3	7.6	11.8	12.9	10	.0971	●	●	
STI-M 8	1.25	79	12.60	45	8.1	8.4	9.9	14.6	16.1	12	.0973	●	●	
STI-M 10	1.5	89	16.63	45	10	10.4	12.25	19.1	21	14	.0975	●	●	
STI-M 12	1.75	102	19.38	48	12.1	12.5	14.6	22.2	24.5	16	.0977	●	●	
STI-M 14	2	102	22.12	48	14.1	14.5	16.9	25.3	28	18	.0978	●	●	
STI-M 16	2	115	26.17	50	16	16.5	18.9	29.4	32.4	20	.0979	●	●	

Thread Depth

**2 x D**

**Tool Identification**

											GF432201		GF432206	
											BGF-VHM-Z2 2xD R30-IKZ-HB		BGF-VHM-Z2 2xD R30-IKZ-HB TICN	
Nominal Size ø D	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	ø d <sub>1</sub>	mm ø d <sub>3</sub>	ø d <sub>5</sub>	l <sub>B</sub>	l <sub>E</sub>	ø d <sub>2</sub>	Dimens. ID			
STI-M 6	1	74	13.10	40	6	6.3	7.6	14.8	15.9	10	.0971	●	●	
STI-M 8	1.25	79	16.35	45	8.1	8.4	9.9	18.4	19.9	12	.0973	●	●	
STI-M 10	1.5	89	21.13	45	10	10.4	12.25	23.6	25.5	14	.0975	●	●	
STI-M 12	1.75	102	24.63	48	12.1	12.5	14.6	27.5	29.7	16	.0977	●	●	
STI-M 14	2	102	30.12	48	14.1	14.5	16.9	33.3	36	18	.0978	●	●	
STI-M 16	2	115	34.17	50	16	16.5	18.9	37.4	40.4	20	.0979	●	●	

Other sizes upon request

Product Finder

V<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

PT

NPTF

Rc (BSPT)

**STI**

SELF-LOCK

Accessories

Tech. Info

**BGF**

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

ZGF(I)

CIRC-GF

Gigant

MoSys



Product  
Finder

V<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

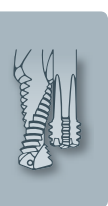
GF(I)-KEG

ZGF(I)

CIRC-GF

Gigant

MoSys





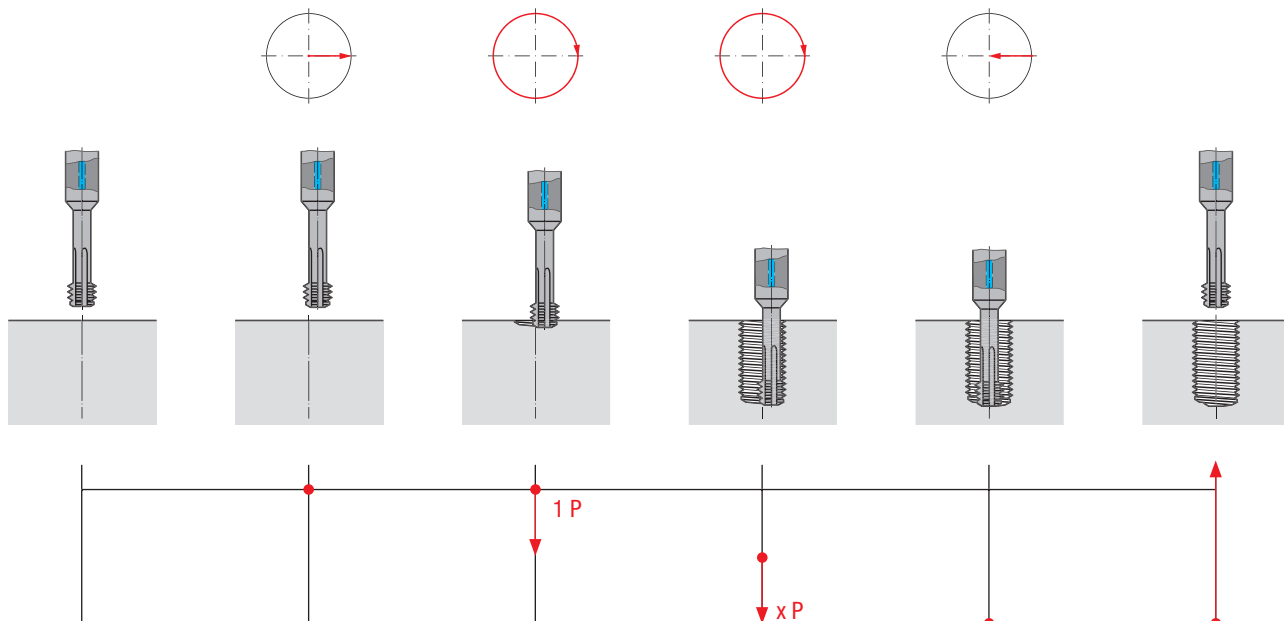


	Page	
200	201	
202	203	
204	205	206

<b>UNC</b>
<b>UNF</b>
<b>M, MF</b>

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- P
- PPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF**
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

**Thread milling cycle**



- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Metric Shank

Carbide

RH

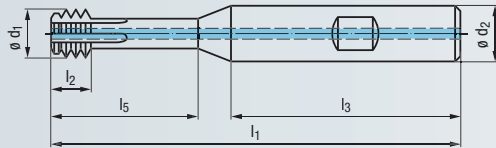
LH-rot.

4-5 Flutes

DIN 6535

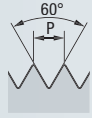
HB  
HE  
HA

ø D



For hard materials

# UNC



Unified coarse thread  
ASME B1.1

Coating

TIALN-T3

Range of Application

N 2.7-8

H 1.1-5

Thread Depth

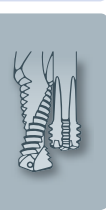
## 2 x D

#### Tool Identification

GF733208

Nominal Size	ø D	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	l <sub>5</sub>	ø d <sub>1</sub>	ø d <sub>2</sub>		Flutes	Dimens. ID	ZBGF-H-VHM 2xD IKZ-HB TIALN-T3
								inch	mm			
5/16	18	2.992	0.220	1.575	0.866	0.222	0.394	10	4	.5010	•	
3/8	16	2.992	0.252	1.575	1.063	0.282	0.394	10	4	.5011	•	
7/16	14	3.386	0.287	1.772	1.220	0.333	0.472	12	4	.5012	•	
1/2	13	3.386	0.307	1.772	1.299	0.397	0.472	12	4	.5013	•	
5/8	11	3.858	0.362	1.890	1.654	0.507	0.630	16	4	.5015	•	
3/4	10	4.370	0.402	1.969	2.008	0.610	0.787	20	5	.5016	•	

Other sizes upon request



**Metric Shank**

Carbide

RH + LH

RH-rot.

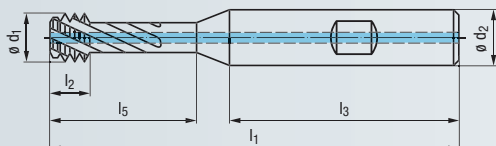
R30

3-5 Flutes

DIN 6535

HB  
HE  
HA

ø D



For soft/unhardened materials

Coating

TIALN-T4

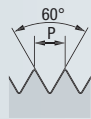
Range of Application

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-6, 2.1-6, 3.1-2, 4.1, 4.3-4
- S 1.1-3, 2.1-2, 2.4
- H 1.1-2

Thread Depth

**2 x D**

**UNC**



Unified coarse thread  
ASME B1.1

**Tool Identification**

**GF732257**

Nominal Size	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	l <sub>5</sub>	ø d <sub>1</sub>	inch ø d <sub>2</sub>	mm	Flutes	Dimens. ID	ZBGF-W-VHM 2xD
1/4	20	2.362	0.228	1.417	0.669	0.183	0.315	8	3	.5009	●
5/16	18	2.992	0.252	1.575	0.866	0.222	0.394	10	4	.5010	●
3/8	16	2.992	0.283	1.575	1.024	0.282	0.394	10	4	.5011	●
7/16	14	3.386	0.319	1.772	1.220	0.333	0.472	12	4	.5012	●
1/2	13	3.386	0.350	1.772	1.299	0.397	0.472	12	4	.5013	●
5/8	11	3.858	0.409	1.890	1.654	0.507	0.630	16	4	.5015	●
3/4	10	4.370	0.449	1.969	2.008	0.610	0.787	20	5	.5016	●

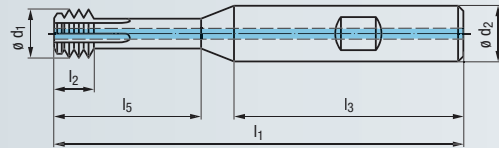
Other sizes upon request

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF**
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF**
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Metric Shank



Carbide

RH

LH-rot.

4-5 Flutes

DIN 6535

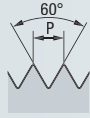
HB  
HE  
HA

ø D



For hard materials

# UNF



Unified fine thread  
ASME B1.1

Coating

TIALN-T3

Range of Application

N 2.7-8

H 1.1-5

Thread Depth

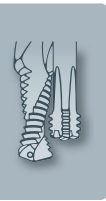
## 2 x D

#### Tool Identification

GF733208

Nominal Size	ø D	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	l <sub>5</sub>	ø d <sub>1</sub>	ø d <sub>2</sub>		Flutes	Dimens. ID	ZBGF-H-VHM 2xD IKZ-HB TIALN-T3
								inch	mm			
5/16		24	2.992	0.165	1.575	0.866	0.222	0.394	10	4	.5044	●
3/8		24	2.992	0.165	1.575	1.063	0.281	0.394	10	4	.5045	●
7/16 - 1/2		20	3.386	0.201	1.772	1.299	0.333	0.472	12	4	.5046	●
9/16 - 5/8		18	3.858	0.220	1.890	1.614	0.444	0.630	16	4	.5048	●
3/4		16	4.370	0.252	1.969	2.008	0.606	0.787	20	5	.5050	●

Other sizes upon request



**Metric Shank**

Carbide

RH + LH

RH-rot.

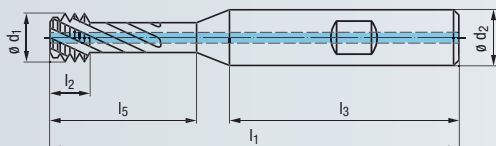
R30

3-5 Flutes

DIN 6535

HB  
HE  
HA

ø D



For soft/unhardened materials

Coating

TIALN-T4

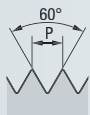
Range of Application

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-6, 2.1-6, 3.1-2, 4.1, 4.3-4
- S 1.1-3, 2.1-2, 2.4
- H 1.1-2

Thread Depth

**2 x D**

**UNF**



Unified fine thread  
ASME B1.1

**Tool Identification**

**GF732257**

Nominal Size	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	l <sub>5</sub>	ø d <sub>1</sub>	inch ø d <sub>2</sub>	mm	Flutes	Dimens. ID	ZBGF-W-VHM 2xD	R30-IKZ-HB	TIALN-T4
1/4	28	2.362	0.138	1.417	0.669	0.183	0.315	8	3	.5043	●		
5/16	24	2.992	0.189	1.575	0.866	0.222	0.394	10	4	.5044	●		
3/8	24	2.992	0.189	1.575	1.024	0.281	0.394	10	4	.5045	●		
7/16 - 1/2	20	3.386	0.228	1.772	1.299	0.333	0.472	12	4	.5046	●		
9/16 - 5/8	18	3.858	0.252	1.890	1.614	0.444	0.630	16	4	.5048	●		
3/4	16	4.370	0.283	1.969	2.008	0.606	0.787	20	5	.5050	●		

Other sizes upon request

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Metric Shank

Carbide

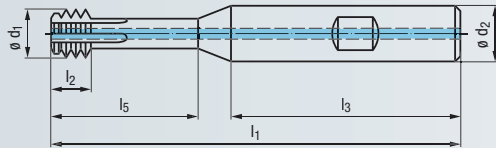
RH

LH-rot.

4 Flutes

DIN 6535

HB  
HE  
HA



For hard materials

# M, MF



ISO Metric threads  
DIN 13

Coating

TIALN-T3

Range of Application

N 2.7-8

H 1.1-5

Thread Depth

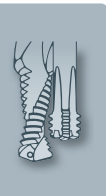
## 2 x D

#### Tool Identification

GF733208

P mm	ø D	l <sub>1</sub>	l <sub>2</sub>	mm			l <sub>5</sub>	ø d <sub>1</sub>	ø d <sub>2</sub>	Flutes	Dimens. ID	ZBGF-H-VHM 2xD IKZ-HB TIALN-T3
				l <sub>3</sub>	l <sub>4</sub>	l <sub>5</sub>						
1.25	M 8 - M10 x 1.25	71	5	40	19	6.2	10	4	.0080	•		
1.5	M10 - M12 x 1.5	76	6	40	25	7.75	10	4	.0100	•		
1.75	M12	86	7	45	31	9.2	12	4	.0112	•		
2	M14 - M16	98	8	48	36	11.1	16	4	.0114	•		

Other sizes upon request



**Metric Shank**

Carbide

RH + LH

RH-rot.

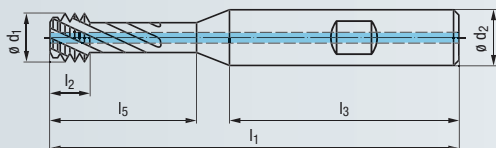
R30

3-4 Flutes

DIN 6535

HB  
HE  
HA

ø D



For soft/unhardened materials

Coating

TIALN-T4

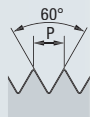
Range of Application

- P** 1.1-5.1
- M** 1.1-4.1
- K** 1.1-4.2
- N** 1.1-6, 2.1-6, 3.1-2, 4.1, 4.3-4
- S** 1.1-3, 2.1-2, 2.4
- H** 1.1-2

Thread Depth

**2 x D**

**M, MF**



ISO Metric threads  
DIN 13

**Tool Identification**

**GF732257**

P mm	ø D	mm				ø d <sub>1</sub>	ø d <sub>2</sub>	Flutes	Dimens. ID	ZBGF-W-VHM 2xD R30-IKZ-HB TIALN-T4
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>5</sub>					
<b>1</b>	M 6 - M 7	60	4.6	36	16	4.5	8	3	<b>.0060</b>	●
<b>1.25</b>	M 8 - M10 x 1.25	71	5.7	40	21	6.2	10	4	<b>.0080</b>	●
<b>1.5</b>	M10 - M12 x 1.5	76	6.9	40	26	7.75	10	4	<b>.0100</b>	●
<b>1.75</b>	M12	86	7.9	45	32	9.2	12	4	<b>.0112</b>	●
<b>2</b>	M14 - M16	98	9.1	48	41	11.08	16	4	<b>.0114</b>	●

Other sizes upon request

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M**
- MF**
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF**
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Metric Shank

Carbide

RH + LH

RH-rot.

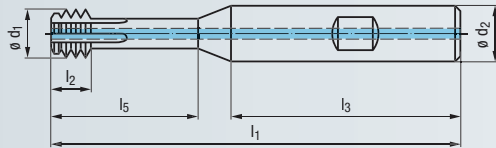
3-4 Flutes

DIN 6535

HB  
HE  
HA



For the machining of aluminum and cast iron



# M, MF



ISO Metric threads  
DIN 13

Coating

TICN

Range of Application

K 1.1-2

N 1.1-6, 3.1-2

Thread Depth

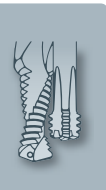
## 3 x D

#### Tool Identification

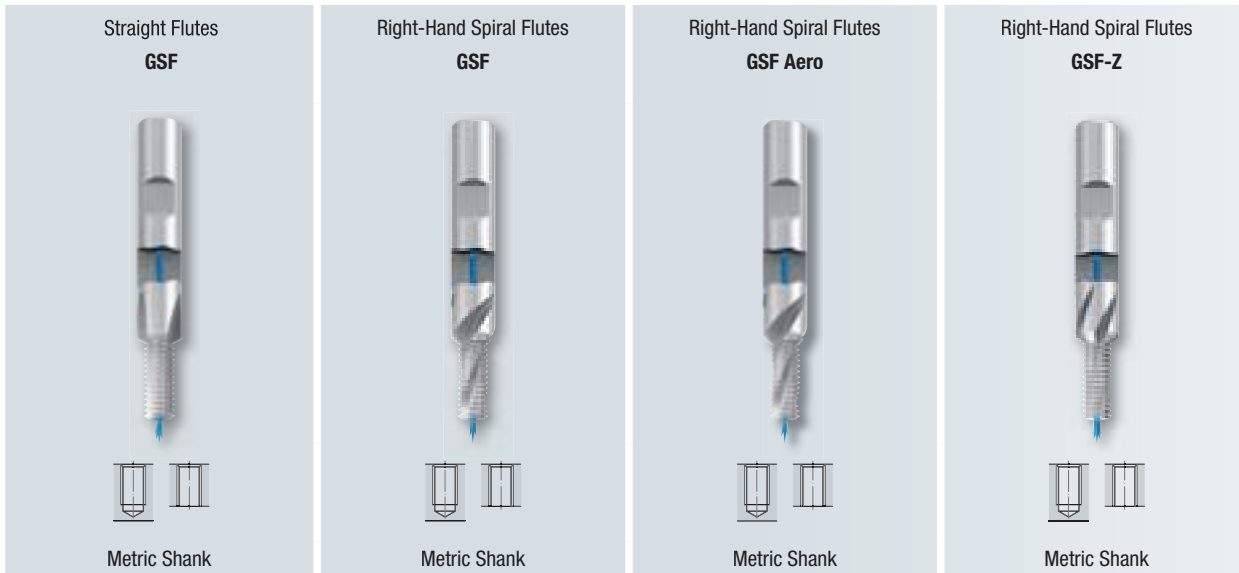
GF753276

P mm	ø D	mm					ø d <sub>1</sub>	ø d <sub>2</sub>	Flutes	Dimens. ID	ZBGF-T-VHM 3xD IKZ-HB TICN
		l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>5</sub>						
1	M 6 - M 7	65	4	36	20	4.5	8	3	.0060	●	
1.25	M 8 - M10 x 1.25	80	5	40	27	6.2	10	4	.0080	●	
1.5	M10 - M12 x 1.5	85	6	40	34	7.75	10	4	.0100	●	
1.75	M12	100	7	45	39	9.2	12	4	.0112	●	

Other sizes upon request







Page

	208	209		<b>UNC</b>
	210	211		<b>UNF</b>
	212		213	<b>M</b>
	214		215	<b>MF</b>
	216			<b>G</b>
217				<b>LK-M</b>

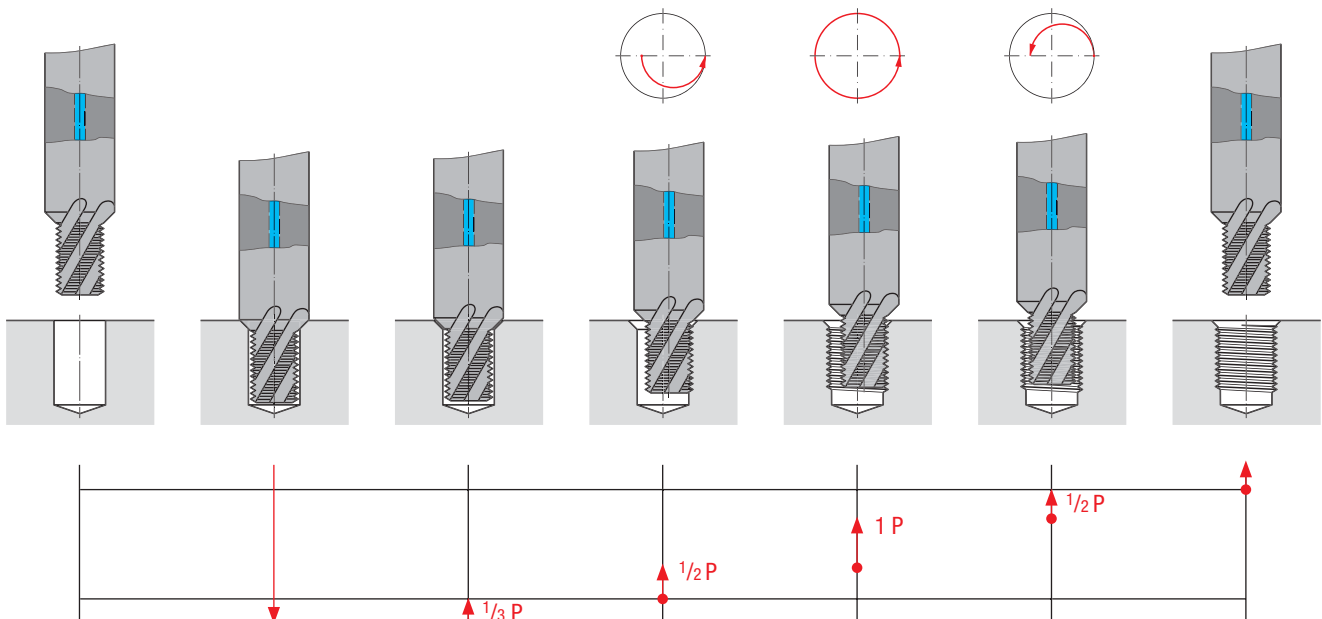
- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)**
- GSF-Z**
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

**Possible modifications**



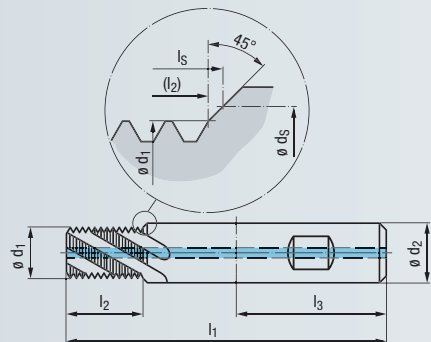
For a description of these modifications, see page 279

**Thread milling cycle**



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### Metric Shank



Carbide

R30

RH + LH

3-5 Flutes

DIN 6535



Coating

TICN

Range of Application

- P 1.1-3.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-4.2, 5.2
- S 1.1-2

- P 1.1-3.1
- M 1.1-2.1
- K 1.1-4.2
- N 1.1-2.7, 3.1-5.2
- S 1.1-2, 2.1

Thread Depth

### 1.5 x D

#### Tool Identification

GF322101

GF322106

Nominal Size	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			l <sub>s</sub>	ø d <sub>2</sub>		Flutes	Dimens. ID
				ø d <sub>1</sub>	ø d <sub>s</sub>	l <sub>3</sub>		inch	mm		
No. 12	24	2.441	0.354	1.417	0.163	0.228	0.382	0.315	8	3	.5008
1/4	20	2.441	0.425	1.417	0.185	0.262	0.461	0.315	8	3	.5009
5/16	18	2.913	0.528	1.575	0.242	0.325	0.567	0.394	10	3	.5010
3/8	16	3.150	0.594	1.772	0.301	0.387	0.634	0.472	12	3	.5011
7/16	14	3.150	0.681	1.772	0.354	0.450	0.720	0.472	12	3	.5012
1/2	13	3.543	0.811	1.772	0.407	0.512	0.854	0.551	14	4	.5013
9/16	12	3.937	0.878	1.890	0.465	0.575	0.925	0.630	16	4	.5014
5/8	11	4.016	0.957	1.890	0.516	0.637	1.008	0.709	18	4	.5015
3/4	10	4.331	1.154	1.969	0.630	0.762	1.209	0.787	20	5	.5016

GSF-VHM  
1.5xD  
R30-1KZ-HB

GSF-VHM  
1.5xD  
R30-1KZ-HB  
TICN

Thread Depth

### 2 x D

#### Tool Identification

GF332101

GF332106

Nominal Size	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			l <sub>s</sub>	ø d <sub>2</sub>		Flutes	Dimens. ID
				ø d <sub>1</sub>	ø d <sub>s</sub>	l <sub>3</sub>		inch	mm		
No. 12	24	2.441	0.437	1.417	0.163	0.228	0.469	0.315	8	3	.5008
1/4	20	2.441	0.524	1.417	0.185	0.262	0.559	0.315	8	3	.5009
5/16	18	2.913	0.638	1.575	0.242	0.325	0.677	0.394	10	3	.5010
3/8	16	3.150	0.783	1.772	0.301	0.387	0.819	0.472	12	3	.5011
7/16	14	3.150	0.894	1.772	0.354	0.450	0.937	0.472	12	3	.5012
1/2	13	3.543	1.039	1.772	0.407	0.512	1.087	0.551	14	4	.5013
9/16	12	3.937	1.209	1.890	0.465	0.575	1.260	0.630	16	4	.5014
5/8	11	4.016	1.319	1.890	0.516	0.637	1.374	0.709	18	4	.5015
3/4	10	4.331	1.551	1.969	0.630	0.762	1.610	0.787	20	5	.5016

GSF-VHM  
2xD  
R30-1KZ-HB

GSF-VHM  
2xD  
R30-1KZ-HB  
TICN

Thread Depth

### 2.5 x D

#### Tool Identification

GF342101

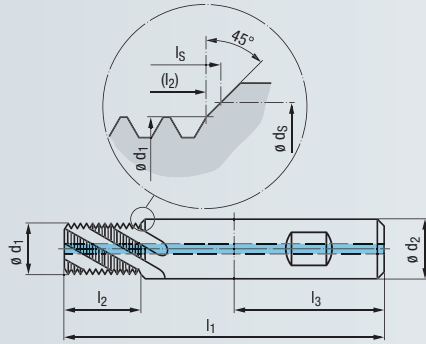
GF342106

Nominal Size	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			l <sub>s</sub>	ø d <sub>2</sub>		Flutes	Dimens. ID
				ø d <sub>1</sub>	ø d <sub>s</sub>	l <sub>3</sub>		inch	mm		
3/8	16	3.346	0.969	1.772	0.301	0.387	1.008	0.472	12	3	.5011
7/16	14	3.346	1.110	1.772	0.354	0.450	1.150	0.472	12	3	.5012
1/2	13	3.780	1.272	1.772	0.407	0.512	1.315	0.551	14	4	.5013
9/16	12	4.213	1.461	1.890	0.465	0.575	1.508	0.630	16	4	.5014
5/8	11	4.331	1.594	1.890	0.516	0.637	1.646	0.709	18	4	.5015
3/4	10	4.921	1.953	1.969	0.630	0.762	2.012	0.787	20	5	.5016

GSF-VHM  
2.5xD  
R30-1KZ-HB

GSF-VHM  
2.5xD  
R30-1KZ-HB  
TICN

**Metric Shank**



Carbide

R15

RH + LH

3-5 Flutes



DIN 6535



Coating

TICN

Range of Application

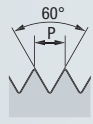
- P 1.1-5.1**
- K 1.1-4.2**
- N 1.1-5, 2.1-6, 3.1-4.2, 5.2**
- S 1.1-3**

- P 1.1-5.1**
- M 1.1-4.1**
- K 1.1-4.2**
- N 1.1-5.2**
- S 1.1-2.6**
- H 1.1-2**

Thread Depth

**2 x D**

**UNC**



Unified coarse thread  
ASME B1.1

**Tool Identification**

												GF335101	GF335106
												GSF-VHM 2xD R15-IKZ-HB	GSF-VHM 2xD R15-IKZ-HB TICN
Nominal Size $\phi D$	T.P.I.	$l_1$	$l_2$	inch			$l_s$	$\phi d_2$		Flutes	Dimens. ID		
				$l_3$	$\phi d_1$	$\phi d_s$		inch	mm				
No. 10	24	2.165	0.395	1.417	0.136	0.202	0.425	0.236	6	3	.5007	●	●
No. 12	24	2.441	0.437	1.417	0.163	0.228	0.469	0.315	8	3	.5008		
1/4	20	2.441	0.524	1.417	0.185	0.262	0.559	0.315	8	3	.5009	●	●
5/16	18	2.913	0.638	1.575	0.242	0.325	0.677	0.394	10	3	.5010	●	●
3/8	16	3.150	0.783	1.772	0.301	0.387	0.819	0.472	12	3	.5011	●	●
7/16	14	3.150	0.894	1.772	0.354	0.450	0.937	0.472	12	3	.5012	●	●
1/2	13	3.543	1.039	1.772	0.407	0.512	1.087	0.551	14	4	.5013	●	●
9/16	12	3.937	1.209	1.890	0.465	0.575	1.260	0.630	16	4	.5014	●	●
5/8	11	4.016	1.319	1.890	0.516	0.637	1.374	0.709	18	4	.5015	●	●
3/4	10	4.331	1.551	1.969	0.630	0.762	1.610	0.787	20	5	.5016		

Other sizes upon request

Product Finder

$v_c$

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF Aero

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

ZGF(I)

CIRC-GF

Gigant

MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### Metric Shank

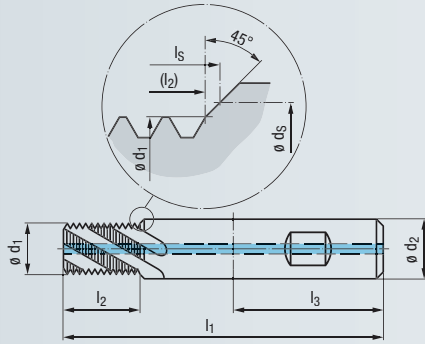
Carbide

R30

RH + LH

3-5 Flutes

DIN 6535



Coating

TICN

Range of Application

- P 1.1-3.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-4.2, 5.2
- S 1.1-2

- P 1.1-3.1
- M 1.1-2.1
- K 1.1-4.2
- N 1.1-2.7, 3.1-5.2
- S 1.1-2, 2.1

Thread Depth

### 1.5 x D

### UNF



Unified fine thread  
ASME B1.1

#### Tool Identification

Nominal Size	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			l <sub>s</sub>	inch		Flutes	Dimens. ID
				l <sub>3</sub>	φ d <sub>1</sub>	φ d <sub>s</sub>		φ d <sub>2</sub>	mm		
No. 10	32	2.165	0.299	1.417	0.150	0.202	0.319	0.236	6	3	.5041
No. 12	28	2.441	0.339	1.417	0.169	0.228	0.366	0.315	8	3	.5042
1/4	28	2.441	0.413	1.417	0.203	0.262	0.437	0.315	8	3	.5043
5/16	24	2.913	0.480	1.575	0.260	0.325	0.508	0.394	10	3	.5044
3/8	24	3.150	0.563	1.772	0.323	0.387	0.591	0.472	12	3	.5045
7/16	20	3.150	0.677	1.772	0.376	0.450	0.709	0.472	12	3	.5046
1/2	20	3.543	0.776	1.772	0.437	0.512	0.807	0.551	14	4	.5047
9/16	18	3.937	0.862	1.890	0.492	0.575	0.898	0.630	16	4	.5048
5/8	18	4.016	0.976	1.890	0.555	0.637	1.008	0.709	18	4	.5049
3/4	16	4.331	1.161	1.969	0.669	0.762	1.197	0.787	20	5	.5050

GF322101

GF322106

GSF-VHM  
1.5xD  
R30-1KZ-HB

GSF-VHM  
1.5xD  
R30-1KZ-HB  
TICN

Thread Depth

### 2 x D

#### Tool Identification

Nominal Size	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			l <sub>s</sub>	inch		Flutes	Dimens. ID
				l <sub>3</sub>	φ d <sub>1</sub>	φ d <sub>s</sub>		φ d <sub>2</sub>	mm		
No. 10	32	2.165	0.390	1.417	0.150	0.202	0.413	0.236	6	3	.5041
No. 12	28	2.441	0.449	1.417	0.169	0.228	0.472	0.315	8	3	.5042
1/4	28	2.441	0.520	1.417	0.203	0.262	0.543	0.315	8	3	.5043
5/16	24	2.913	0.646	1.575	0.260	0.325	0.673	0.394	10	3	.5044
3/8	24	3.150	0.772	1.772	0.323	0.387	0.799	0.472	12	3	.5045
7/16	20	3.150	0.878	1.772	0.376	0.450	0.909	0.472	12	3	.5046
1/2	20	3.543	1.028	1.772	0.437	0.512	1.059	0.551	14	4	.5047
9/16	18	3.937	1.142	1.890	0.492	0.575	1.177	0.630	16	4	.5048
5/8	18	4.016	1.307	1.890	0.555	0.637	1.343	0.709	18	4	.5049
3/4	16	4.331	1.535	1.969	0.669	0.762	1.575	0.787	20	5	.5050

GF332101

GF332106

GSF-VHM  
2xD  
R30-1KZ-HB

GSF-VHM  
2xD  
R30-1KZ-HB  
TICN

Other sizes upon request

**Metric Shank**

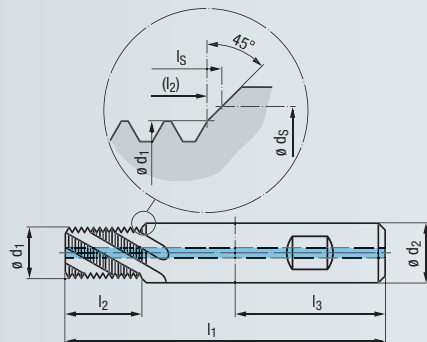
Carbide

R15

RH + LH

3-5 Flutes

DIN 6535



Coating

TICN

Range of Application

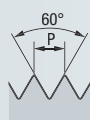
- P 1.1-5.1**
- K 1.1-4.2**
- N 1.1-5, 2.1-6, 3.1-4.2, 5.2**
- S 1.1-3**

- P 1.1-5.1**
- M 1.1-4.1**
- K 1.1-4.2**
- N 1.1-5.2**
- S 1.1-2.6**
- H 1.1-2**

Thread Depth

**2 x D**

**UNF**



Unified fine thread  
ASME B1.1

**Tool Identification**

												GF335101	GF335106		
												GSF-VHM 2xD R15-IKZ-HB	GSF-VHM 2xD R15-IKZ-HB TICN		
Nominal Size $\phi D$	T.P.I.	$l_1$	$l_2$	inch			$\phi d_1$	$\phi d_s$	$l_s$	$\phi d_2$		Flutes	Dimens. ID		
				$l_3$						inch	mm				
No. 10	32	2.165	0.390	1.417	0.150	0.202	0.413	0.236	6	3			.5041	●	●
No. 12	28	2.441	0.449	1.417	0.169	0.228	0.472	0.315	8	3			.5042		
1/4	28	2.441	0.520	1.417	0.203	0.262	0.543	0.315	8	3			.5043	●	●
5/16	24	2.913	0.646	1.575	0.260	0.325	0.673	0.394	10	3			.5044	●	●
3/8	24	3.150	0.772	1.772	0.323	0.387	0.799	0.472	12	3			.5045	●	●
7/16	20	3.150	0.878	1.772	0.376	0.450	0.909	0.472	12	3			.5046	●	●
1/2	20	3.543	1.028	1.772	0.437	0.512	1.059	0.551	14	4			.5047	●	●
9/16	18	3.937	1.142	1.890	0.492	0.575	1.177	0.630	16	4			.5048	●	●
5/8	18	4.016	1.307	1.890	0.555	0.637	1.343	0.709	18	4			.5049	●	●
3/4	16	4.331	1.535	1.969	0.669	0.762	1.575	0.787	20	5			.5050		

Other sizes upon request

Product Finder

$v_c$

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

**GSF Aero**

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

ZGF(I)

CIRC-GF

Gigant

MoSys

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M**
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### Metric Shank

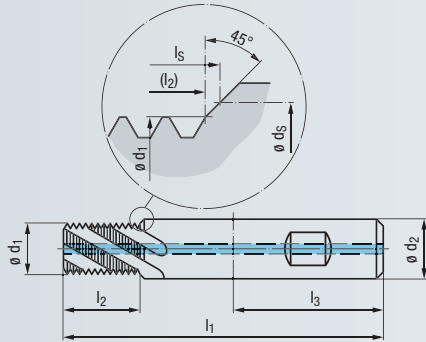
Carbide

R30

RH + LH

3-4 Flutes

DIN 6535



Coating

TICN

Range of Application

- P 1.1-3.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-4.2, 5.2
- S 1.1-2

- P 1.1-3.1
- M 1.1-2.1
- K 1.1-4.2
- N 1.1-2.7, 3.1-5.2
- S 1.1-2, 2.1

Thread Depth

### 1.5 x D

#### Tool Identification

GF322101

GF322106

Nominal Size	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm			Flutes	Dimens. ID	
					ø D	ø d <sub>1</sub>	ø d <sub>S</sub>			
M 5	0.8	55	7.6	36	4	5.3	8.2	6	3	.0050
M 6	1	62	9.5	36	4.8	6.3	10.2	8	3	.0060
M 8	1.25	74	13.1	40	6.5	8.3	13.9	10	3	.0080
M 10	1.5	80	15.8	45	8.2	10.3	16.7	12	3	.0100
M 12	1.75	90	18.4	45	9.9	12.3	19.5	14	4	.0112
M 14	2	100	23	48	11.6	14.3	24.2	16	4	.0114
M 16	2	102	25	48	13.6	16.3	26.2	18	4	.0116

GSF-VHM  
1.5xD  
R30-1KZ-HB

GSF-VHM  
1.5xD  
R30-1KZ-HB  
TICN

Thread Depth

### 2 x D

#### Tool Identification

GF332101

GF332106

Nominal Size	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm			Flutes	Dimens. ID	
					ø D	ø d <sub>1</sub>	ø d <sub>S</sub>			
M 5	0.8	55	10.8	36	4	5.3	11.4	6	3	.0050
M 6	1	62	12.5	36	4.8	6.3	13.2	8	3	.0060
M 8	1.25	74	16.9	40	6.5	8.3	17.7	10	3	.0080
M 10	1.5	80	20.3	45	8.2	10.3	21.2	12	3	.0100
M 12	1.75	90	25.4	45	9.9	12.3	26.5	14	4	.0112
M 14	2	100	29	48	11.6	14.3	30.2	16	4	.0114
M 16	2	102	33	48	13.6	16.3	34.2	18	4	.0116

GSF-VHM  
2xD  
R30-1KZ-HB

GSF-VHM  
2xD  
R30-1KZ-HB  
TICN

Thread Depth

### 2.5 x D

#### Tool Identification

GF342101

GF342106

Nominal Size	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm			Flutes	Dimens. ID	
					ø D	ø d <sub>1</sub>	ø d <sub>S</sub>			
M 5	0.8	58	13.2	36	4	5.3	13.8	6	3	.0050
M 6	1	65	15.5	36	4.8	6.3	16.2	8	3	.0060
M 8	1.25	78	20.6	40	6.5	8.3	21.4	10	3	.0080
M 10	1.5	85	26.3	45	8.2	10.3	27.2	12	3	.0100
M 12	1.75	95	30.7	45	9.9	12.3	31.7	14	4	.0112
M 14	2	110	37	48	11.6	14.3	38.2	16	4	.0114
M 16	2	110	41	48	13.6	16.3	42.2	18	4	.0116

GSF-VHM  
2.5xD  
R30-1KZ-HB

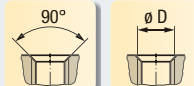
GSF-VHM  
2.5xD  
R30-1KZ-HB  
TICN

**Metric Shank**

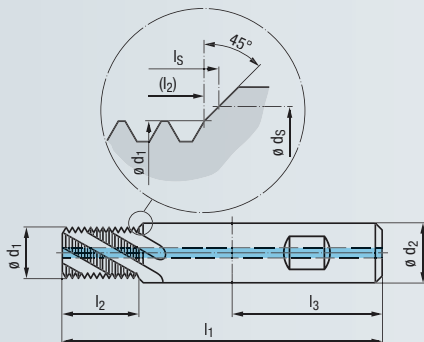
Carbide

R15 RH + LH

4-5 Flutes **DIN 6535**



With increased number of flutes



**M**  
ISO Metric coarse thread  
DIN 13

Coating

TICN

Range of Application

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

Thread Depth

**2 x D**

**Tool Identification**

											GF335126	
											GSF-Z-VHM 2xD R15-IKZ-HB TICN	
Nominal Size	P	$l_1$	$l_2$	$l_3$	mm $\phi d_1$	$\phi d_s$	$l_s$	$\phi d_2$	Flutes	Dimens. ID		
$\phi D$	mm											
M 6	1	62	12.5	36	4.8	6.3	13.2	8	4	.0060	●	
M 8	1.25	74	16.9	40	6.5	8.3	17.7	10	4	.0080	●	
M 10	1.5	80	20.3	45	8.2	10.3	21.2	12	5	.0100	●	
M 12	1.75	90	25.4	45	9.9	12.3	26.5	14	5	.0112	●	

Other sizes upon request

- Product Finder
- $v_c$
- UNC
- UNF
- UN
- M**
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z**
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF**
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### Metric Shank

Carbide

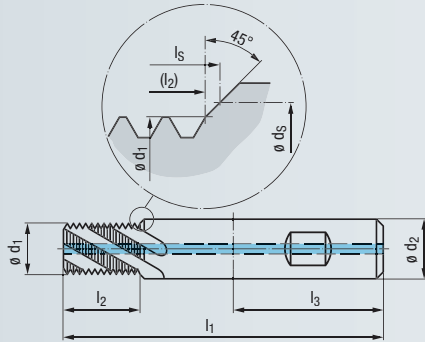
R30

RH + LH

3-4 Flutes

DIN 6535

HB  
HE  
HA



Coating

TICN

Range of Application

- P 1.1-3.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-4.2, 5.2
- S 1.1-2

- P 1.1-3.1
- M 1.1-2.1
- K 1.1-4.2
- N 1.1-2.7, 3.1-5.2
- S 1.1-2, 2.1

# MF



ISO Metric fine thread  
DIN 13

Thread Depth

## 1.5 x D

#### Tool Identification

GF322101

GF322106

Nominal Size											Dimens. ID	GSF-VHM 1.5xD R30-1KZ-HB	GSF-VHM 1.5xD R30-1KZ-HB TICN
Ø D	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm Ø d <sub>1</sub>	Ø d <sub>S</sub>	l <sub>S</sub>	Ø d <sub>2</sub>	Flutes				
M 6 x 0.75	62	9.4	36	5	6.3	10	8	3	.0229	•	•		
M 8 x 1	74	12.5	40	6.7	8.3	13.2	10	3	.0251	•	•		
M 10 x 1	80	15.5	45	8.7	10.3	16.2	12	3	.0276	•	•		
M 12 x 1	90	18.5	45	10.6	12.3	19.3	14	4	.0301	•	•		
M 12 x 1.5	90	18.8	45	10.1	12.3	19.7	14	4	.0303	•	•		
M 14 x 1.5	100	21.8	48	12.1	14.3	22.7	16	4	.0331	•	•		
M 16 x 1.5	102	24.8	48	14	16.3	25.8	18	4	.0359	•	•		

Thread Depth

## 2 x D

#### Tool Identification

GF332101

GF332106

Nominal Size											Dimens. ID	GSF-VHM 2xD R30-1KZ-HB	GSF-VHM 2xD R30-1KZ-HB TICN
Ø D	P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm Ø d <sub>1</sub>	Ø d <sub>S</sub>	l <sub>S</sub>	Ø d <sub>2</sub>	Flutes				
M 6 x 0.75	62	12.4	36	5	6.3	13	8	3	.0229	•	•		
M 8 x 1	74	16.5	40	6.7	8.3	17.2	10	3	.0251	•	•		
M 10 x 1	80	20.5	45	8.7	10.3	21.2	12	3	.0276	•	•		
M 12 x 1	90	24.5	45	10.6	12.3	25.3	14	4	.0301	•	•		
M 12 x 1.5	90	24.8	45	10.1	12.3	25.7	14	4	.0303	•	•		
M 14 x 1.5	100	29.3	48	12.1	14.3	30.2	16	4	.0331	•	•		
M 16 x 1.5	102	32.3	48	14	16.3	33.3	18	4	.0359	•	•		

Other sizes upon request

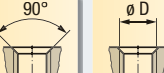



**Metric Shank**

Carbide

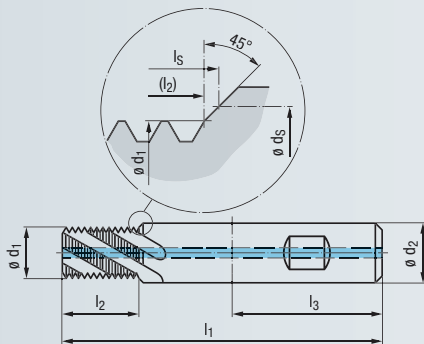
R15 RH + LH

4-5 Flutes **DIN 6535**  
 HB   
 HE   
 HA 

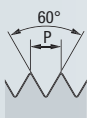
90° 



With increased number of flutes



**MF**



ISO Metric fine thread  
DIN 13

Coating

TICN

Range of Application

- P** 1.1-5.1
- M** 1.1-4.1
- K** 1.1-4.2
- N** 1.1-5.2
- S** 1.1-2.6
- H** 1.1-2

Thread Depth

**2 x D**

**Tool Identification**

GF335126

Nominal Size		P	$l_1$	$l_2$	$l_3$	mm $\phi d_1$	$\phi d_s$	$l_s$	$\phi d_2$	Flutes	Dimens. ID
M 8	x 1	mm	74	16.5	40	6.7	8.3	17.2	10	4	.0251
M 10	x 1	mm	80	20.5	45	8.7	10.3	21.2	12	5	.0276
M 12	x 1.25	mm	90	24.4	45	10.4	12.3	25.2	14	5	.0302

GSF-Z-VHM  
2xD  
R15-IKZ-HB  
TICN

- 
- 
- 

Other sizes upon request

- Product Finder
- $v_c$
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z**
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



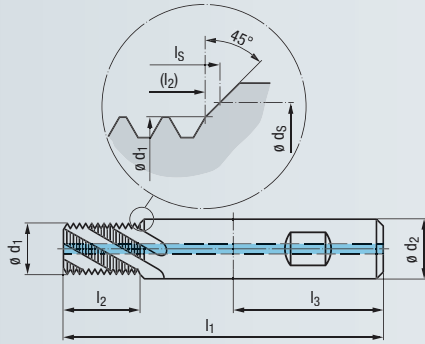
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G**
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info

### Metric Shank

**Carbide**
**R30**
**RH + LH**
**3-4 Flutes**
**DIN 6535**

 HB  
HE  
HA

90°

 $\varnothing D$ 


Coating

**TiCN**

Range of Application

- P 1.1-3.1**
- K 1.1-4.2**
- N 1.1-5, 2.1-6, 3.1-4.2, 5.2**
- S 1.1-2**

- P 1.1-3.1**
- M 1.1-2.1**
- K 1.1-4.2**
- N 1.1-2.7, 3.1-5.2**
- S 1.1-2, 2.1**

Thread Depth

## 1.5 x D

**G**

**Whitworth pipe thread  
DIN EN ISO 228**

**Tool Identification**
**GF322101**
**GF322106**

Nominal Size	$\varnothing D$	T.P.I.	$l_1$	$l_2$	inch			$l_S$	$\varnothing d_2$		Flutes	Dimens. ID
					$l_3$	$\varnothing d_1$	$\varnothing d_S$		inch	mm		
G 1/8	28	3.150	0.591	1.772	0.323	0.394	0.618	0.472	12	3	.4035	
G 1/4	19	3.937	0.815	1.890	0.433	0.531	0.858	0.630	16	4	.4036	
G 3/8	19	4.016	1.028	1.890	0.571	0.669	1.071	0.709	18	4	.4037	

 GSF-VHM  
1.5xD  
R30-1KZ-HB

 GSF-VHM  
1.5xD  
R30-1KZ-HB  
TiCN

Thread Depth

## 2 x D

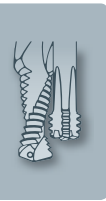
**Tool Identification**
**GF332101**
**GF332106**

Nominal Size	$\varnothing D$	T.P.I.	$l_1$	$l_2$	inch			$l_S$	$\varnothing d_2$		Flutes	Dimens. ID
					$l_3$	$\varnothing d_1$	$\varnothing d_S$		inch	mm		
G 1/8	28	3.150	0.803	1.772	0.323	0.394	0.835	0.472	12	3	.4035	
G 1/4	19	3.937	1.079	1.890	0.433	0.531	1.122	0.630	16	4	.4036	
G 3/8	19	4.016	1.343	1.890	0.571	0.669	1.386	0.709	18	4	.4037	

 GSF-VHM  
2xD  
R30-1KZ-HB

 GSF-VHM  
2xD  
R30-1KZ-HB  
TiCN

Other sizes upon request



**Metric Shank**

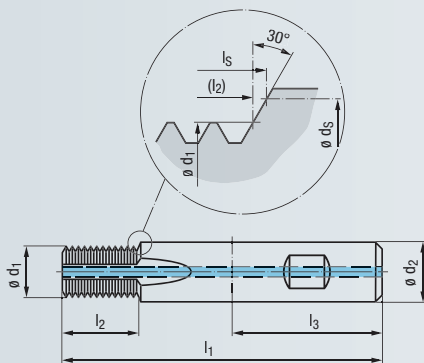
Carbide

RH + LH

3-4 Flutes



DIN 6535



Coating

TICN

Range of Application

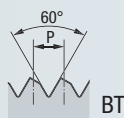
- P 1.1-5.1**
- K 1.1-4.2**
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2**
- S 1.1-3**

- P 1.1-5.1**
- M 1.1-4.1**
- K 1.1-4.2**
- N 1.1-5.2**
- S 1.1-2.6**
- H 1.1-2**

Thread Depth

**2 x D**

**LK-M**



**Metric SELF-LOCK coarse thread  
EMUGE standard**

**Tool Identification**

											GF333101		GF333106	
											GSF-VHM 2xD IKZ-HB		GSF-VHM 2xD IKZ-HB TICN	
Nominal Size $\varnothing D$	P mm	$l_1$	$l_2$	$l_3$	mm $\varnothing d_1$	$\varnothing d_s$	$l_s$	$\varnothing d_2$	Flutes	Dimens. ID				
LK-M 5	0.8	55	10.7	36	4	5.3	11.1	6	3	.1050	●	●	●	●
LK-M 6	1	62	12.4	36	4.8	6.3	12.8	8	3	.1052	●	●	●	●
LK-M 8	1.25	74	16.7	40	6.5	8.3	17.3	10	3	.1054	●	●	●	●
LK-M 10	1.5	80	20.1	45	8.2	10.3	20.7	12	3	.1056	●	●	●	●
LK-M 12	1.75	90	25.2	45	9.9	12.3	25.9	14	4	.1058	●	●	●	●

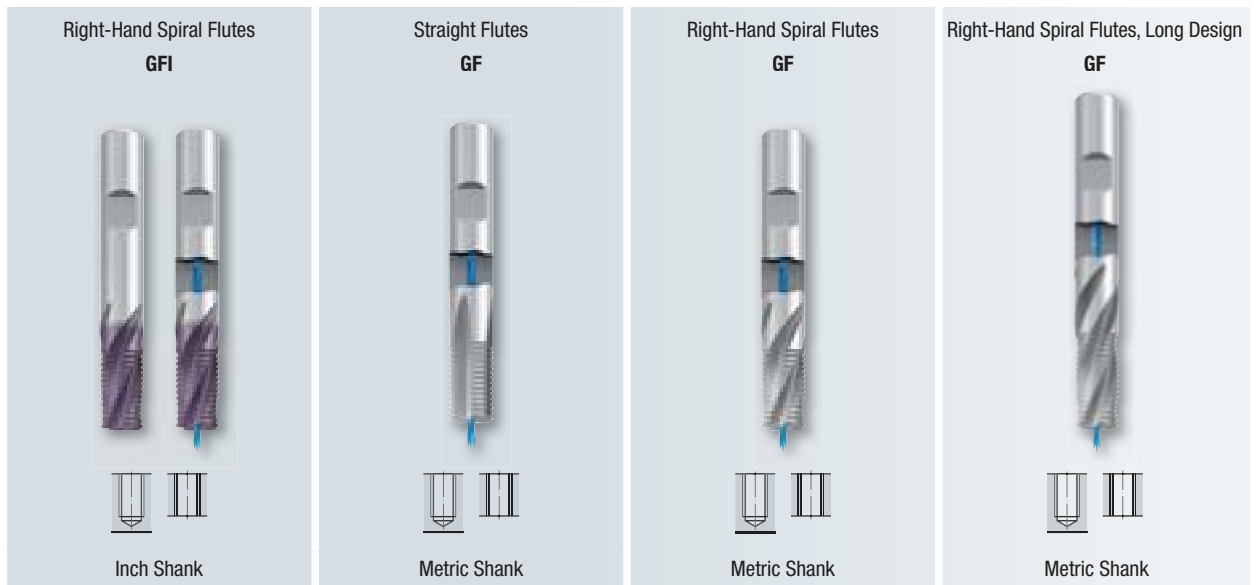
Other sizes upon request

- Product Finder
- $v_c$
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK**
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)**
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



**Product Finder**

- V<sub>c</sub>**
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- R<sub>p</sub> (BSPP)
- W
- BSW, BSF
- NPT
- NPTF



Page

<b>UNC</b>	220			
<b>UNF</b>	221			
<b>UN</b>		222		223
<b>M</b>	224	225		226
<b>MF</b>		225		226
<b>G R<sub>p</sub> (BSPP), W</b>		231	232	
<b>NPSF</b>			233	
<b>LK-M, LK-MF</b>		234		

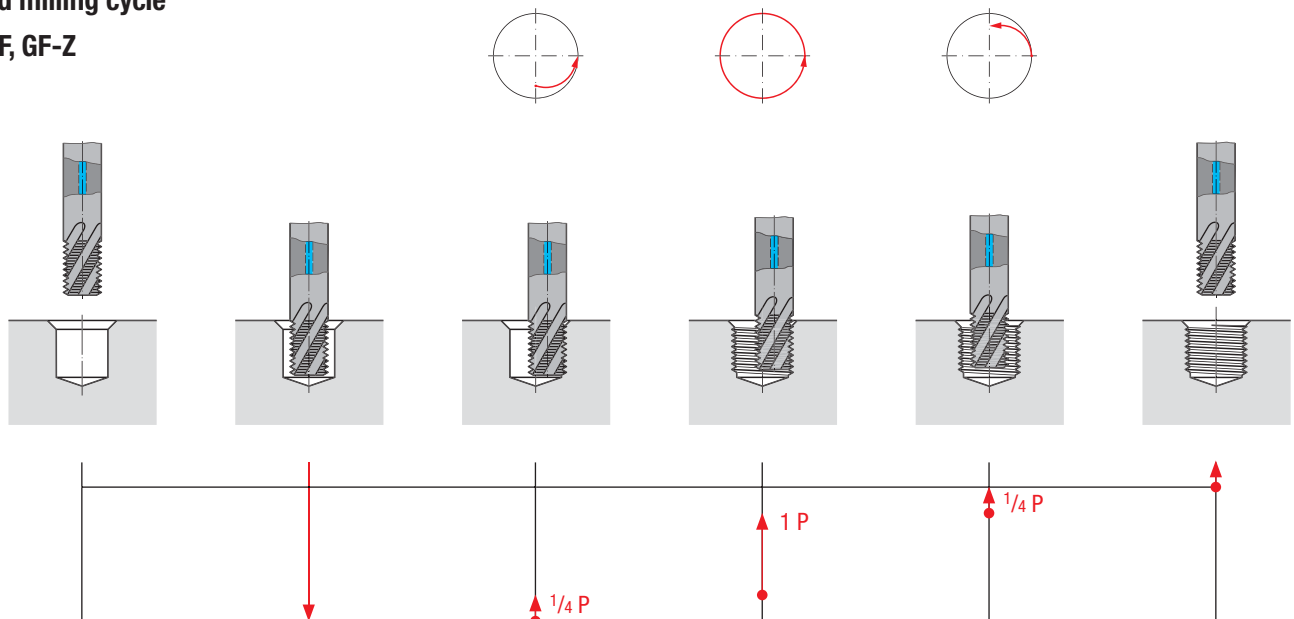
**Possible modifications**

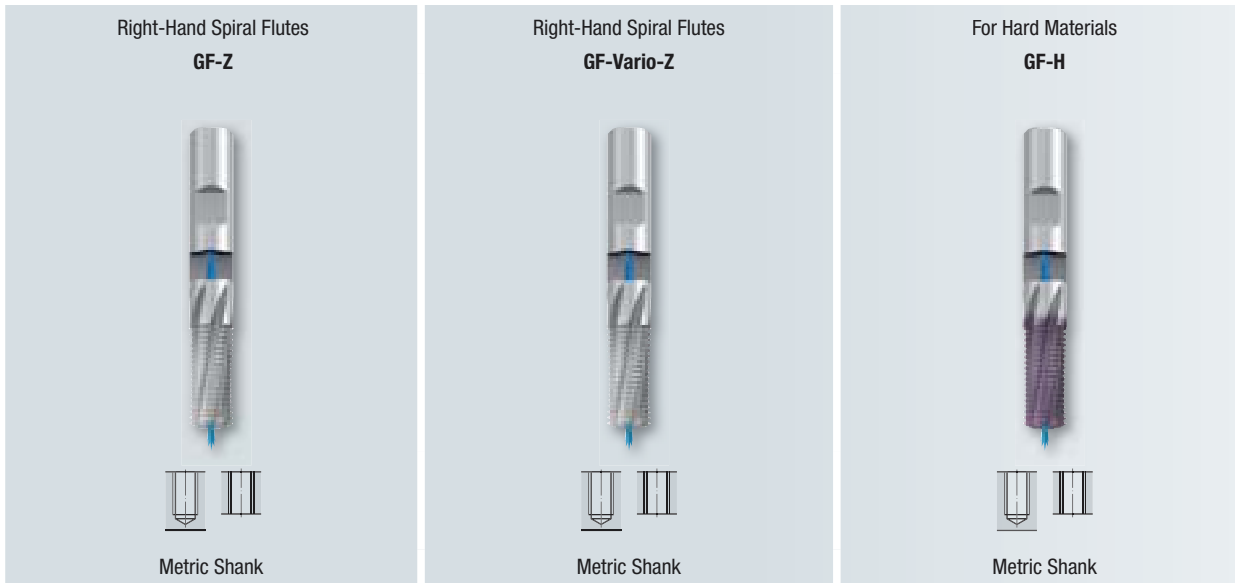


For a description of these modifications, see page 279

**Thread milling cycle**

**GFI, GF, GF-Z**





Page

			<b>UNC</b>
			<b>UNF</b>
			<b>UN</b>
227	228	230	<b>M</b>
227	228 - 229		<b>MF</b>
			<b>G Rp (BSPP), W</b>
			<b>NPSF</b>
			<b>LK-M, LK-MF</b>

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z**
- GF-Vario-Z**
- GF-H**
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

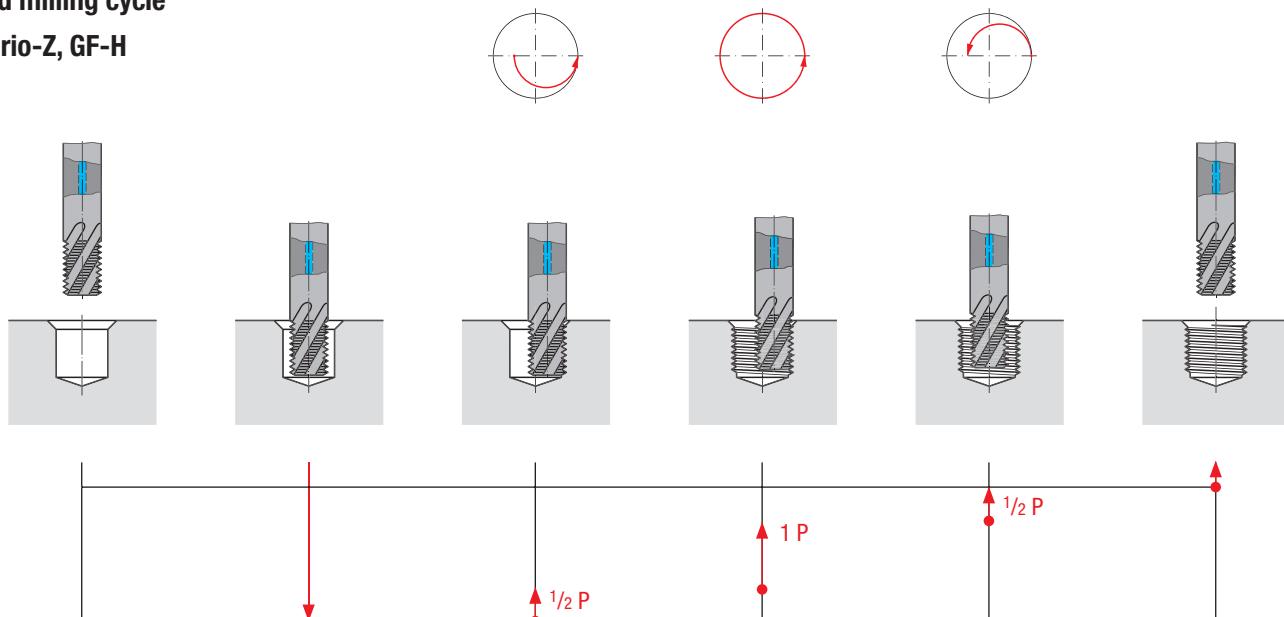
**Possible modifications**



For a description of these modifications, see page 279

**Thread milling cycle**

**GF-Vario-Z, GF-H**



- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GFI, GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Inch Shank

Carbide

R15

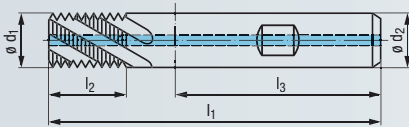
RH + LH

3-4 Flutes

ASME B94.19



For internal threads



Without internal coolant supply (IKZ)



With internal coolant supply (IKZ)



Coating

TICN

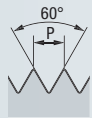
TICN

Range of Application

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

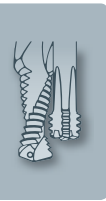
# UNC



Unified coarse thread  
ASME B1.1

Nominal Size $\phi D$	T.P.I.	$\phi d_1$	$l_1$	inch $l_2$	$l_3$	$\phi d_2$	Flutes	GFI-VHM R15-HB TICN		GFI-VHM R15-IKZ-HB TICN	
No. 10	24	0.136	2 1/2	0.395	1 3/8	1/4	3	GFR15106.5007	●	GFR35106.5007	●
1/4	20	0.185	2 1/2	0.524	1 3/8	1/4	3	GFR15106.5009	●	GFR35106.5009	●
5/16	18	0.242	2 1/2	0.637	1 3/8	1/4	3	GFR15106.5010	●	GFR35106.5010	●
3/8	16	0.301	2 1/2	0.780	1 3/8	5/16	3	GFR15106.5011	●	GFR35106.5011	●
7/16	14	0.354	3	0.891	1 9/16	3/8	3	GFR15106.5012	●	GFR35106.5012	●
1/2	13	0.371	3	1.036	1 9/16	3/8	3	GFR15106.5013	●	GFR35106.5013	●
5/8	11	0.496	3 3/4	1.316	1 25/32	1/2	4	GFR15106.5015	●	GFR35106.5015	●
3/4	10	0.621	4 1/4	1.548	1 29/32	5/8	4	GFR15106.5016	●	GFR35106.5016	●
7/8	9	0.621	4 1/4	1.829	1 29/32	5/8	4	GFR15106.5017	●	GFR35106.5017	●
1	8	0.746	4 3/4	2.058	2 1/32	3/4	4	GFR15106.5018	●	GFR35106.5018	●
1 1/8	8										

Tools for different thread pitch upon request

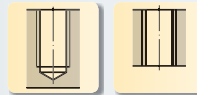


**Inch Shank**

Carbide

R15 RH + LH

3-4 Flutes ASME B94.19



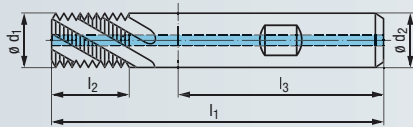
Without internal coolant supply (IKZ)



With internal coolant supply (IKZ)



For internal threads



Coating

TICN

TICN

Range of Application

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

**UNF**  
Unified fine thread  
ASME B1.1



Nominal Size ø D	T.P.I.	ø d <sub>1</sub>	l <sub>1</sub>	inch l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	Flutes	GFI-VHM R15-HB TICN		GFI-VHM R15- <b>IKZ</b> -HB TICN	
No. 10	32	0.150	2 1/2	0.390	1 3/8	1/4	3	GFR15106.5041	●	GFR35106.5041	●
1/4	28	0.203	2 1/2	0.517	1 3/8	1/4	3	GFR15106.5043	●	GFR35106.5043	●
5/16	24	0.246	2 1/2	0.644	1 3/8	1/4	3	GFR15106.5044	●	GFR35106.5044	●
3/8	24	0.309	2 1/2	0.769	1 3/8	5/16	3	GFR15106.5045	●	GFR35106.5045	●
7/16	20	0.371	3	0.874	1 9/16	3/8	3	GFR15106.5046	●	GFR35106.5046	●
1/2	20	0.371	3	1.023	1 9/16	3/8	3	GFR15106.5047	●	GFR35106.5047	●
9/16	18	0.496	3 3/4	1.138	1 25/32	1/2	4	GFR15106.5050	●	GFR35106.5048	●
5/8	18									GFR35106.5048	●
3/4	16	0.621	4 1/4	1.530	1 29/32	5/8	4	GFR15106.5050	●	GFR35106.5050	●
7/8	14	0.621	4 1/4	1.817	1 29/32	5/8	4			GFR35106.5051	
1	14									GFR35106.5051	

Tools for different thread pitch upon request

Product Finder

- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GFI, GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

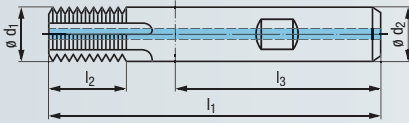
- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN**
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z**
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Metric Shank

**Carbide**
**RH + LH**
**4-5 Flutes**

**DIN 6535**


For internal threads



Coating

**TiCN**

Range of Application

- P 1.1-5.1**
- K 1.1-4.2**
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2**
- S 1.1-3**

- P 1.1-5.1**
- M 1.1-4.1**
- K 1.1-4.2**
- N 1.1-5.2**
- S 1.1-2.6**
- H 1.1-2**

# UN


**Unified threads  
ASME B1.1**
**GF-VHM  
IKZ-HB**
**GF-VHM  
IKZ-HB  
TiCN**

T.P.I.	$\phi D_{min.}$	$\phi d_1$	inch $l_1$	$l_2$	$l_3$	inch $\phi d_2$	mm	Flutes	GF-VHM IKZ-HB	GF-VHM IKZ-HB TiCN
24	1/2	0.390	2.756	0.642	1.575	0.394	10	4	GF163211.9579	GF163216.9579
20	1/2	0.390	2.756	0.673	1.575	0.394	10	4	GF163211.9580	GF163216.9580
20	11/16	0.469	3.150	0.823	1.772	0.472	12	4	GF163121.9580	GF163126.9580
20	7/8	0.626	3.543	1.020	1.890	0.630	16	5	GF163131.9580	GF163136.9580
20	1	0.783	4.134	1.272	1.969	0.787	20	5	GF163151.9580	GF163156.9580
18	1/2	0.390	2.756	0.689	1.575	0.394	10	4	GF163211.9581	GF163216.9581
16	1/2	0.390	2.756	0.654	1.575	0.394	10	4	GF163211.9582	GF163216.9582
16	11/16	0.469	3.150	0.839	1.772	0.472	12	4	GF163121.9582	GF163126.9582
16	7/8	0.626	3.543	1.031	1.890	0.630	16	5	GF163131.9582	GF163136.9582
16	1	0.783	4.134	1.276	1.969	0.787	20	5	GF163151.9582	GF163156.9582
14	7/8	0.626	3.543	1.031	1.890	0.630	16	5	GF163131.9583	GF163136.9583
12	11/16	0.469	3.150	0.870	1.772	0.472	12	4	GF163121.9585	GF163126.9585
12	7/8	0.626	3.543	1.035	1.890	0.630	16	5	GF163131.9585	GF163136.9585
12	1	0.783	4.134	1.287	1.969	0.787	20	5	GF163151.9585	GF163156.9585
10	11/16	0.469	3.150	0.843	1.772	0.472	12	4	GF163121.9587	GF163126.9587
9	11/16	0.469	3.150	0.827	1.772	0.472	12	4	GF163121.9588	GF163126.9588
8	7/8	0.626	3.543	1.055	1.890	0.630	16	5	GF163131.9589	GF163136.9589
8	1	0.783	4.134	1.307	1.969	0.787	20	5	GF163151.9589	GF163156.9589
6	1	0.783	4.134	1.409	1.969	0.787	20	5	GF163151.9591	GF163156.9591

Tools for different thread pitch upon request





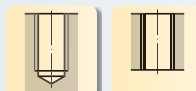
**Metric Shank**

Carbide

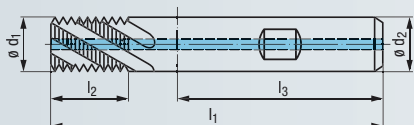
R30 RH + LH

4-5 Flutes **DIN 6535**  
 HB   
 HE   
 HA 

$\phi D$  



For internal threads



Coating

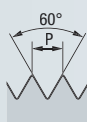
TiCN

Range of Application

- P 1.1-3.1**
- K 1.1-4.2**
- N 1.1-5, 2.1-6, 3.1-4.2, 5.2**
- S 1.1-2**

- P 1.1-3.1**
- M 1.1-2.1**
- K 1.1-4.2**
- N 1.1-2.7, 3.1-5.2**
- S 1.1-2.2.1**

**UN**



Unified threads  
ASME B1.1

T.P.I.	$\phi D_{min.}$	$\phi d_1$	inch			inch		Flutes	GF-VHM R30-Ig-1KZ-HB		GF-VHM R30-Ig-1KZ-HB TiCN	
			$l_1$	$l_2$	$l_3$	$\phi d_2$	mm					
24	1/2	0.390	3.150	0.811	1.575	0.394	10	4	GF162311.9579	●	GF162316.9579	●
20	1/2	0.390	3.150	0.823	1.575	0.394	10	4	GF162311.9580	●	GF162316.9580	●
20	11/16	0.469	3.543	1.024	1.772	0.472	12	4	GF162321.9580	●	GF162326.9580	●
20	7/8	0.626	3.937	1.272	1.890	0.630	16	5	GF162331.9580	●	GF162336.9580	●
20	1	0.783	4.528	1.622	1.969	0.787	20	5	GF162351.9580	●	GF162356.9580	●
18	1/2	0.390	3.150	0.803	1.575	0.394	10	4	GF162311.9581	●	GF162316.9581	●
16	1/2	0.390	3.150	0.839	1.575	0.394	10	4	GF162311.9582	●	GF162316.9582	●
16	11/16	0.469	3.543	1.028	1.772	0.472	12	4	GF162321.9582	●	GF162326.9582	●
16	7/8	0.626	3.937	1.276	1.890	0.630	16	5	GF162331.9582	●	GF162336.9582	●
16	1	0.783	4.528	1.591	1.969	0.787	20	5	GF162351.9582	●	GF162356.9582	●
14	7/8	0.626	3.937	1.315	1.890	0.630	16	5	GF162331.9583	●	GF162336.9583	●
12	11/16	0.469	3.543	1.035	1.772	0.472	12	4	GF162321.9585	●	GF162326.9585	●
12	7/8	0.626	3.937	1.287	1.890	0.630	16	5	GF162331.9585	●	GF162336.9585	●
12	1	0.783	4.528	1.618	1.969	0.787	20	5	GF162351.9585	●	GF162356.9585	●
10	11/16	0.469	3.543	1.043	1.772	0.472	12	4	GF162321.9587	●	GF162326.9587	●
9	11/16	0.469	3.543	1.000	1.772	0.472	12	4	GF162321.9588	●	GF162326.9588	●
8	7/8	0.626	3.937	1.303	1.890	0.630	16	5	GF162331.9589	●	GF162336.9589	●
8	1	0.783	4.528	1.681	1.969	0.787	20	5	GF162351.9589	●	GF162356.9589	●
6	1	0.783	4.528	1.744	1.969	0.787	20	5	GF162351.9591	●	GF162356.9591	●

Tools for different thread pitch upon request

- Product Finder
- $v_c$
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M**
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GFI, GF-Z**
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Inch Shank

Carbide

Without internal coolant supply (IKZ)

R15

RH + LH

3 Flutes



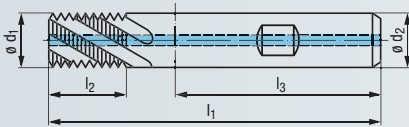
ASME B94.19



ø D



For internal threads



Coating

TICN

Range of Application

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

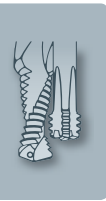
# M



ISO Metric coarse thread  
DIN 13

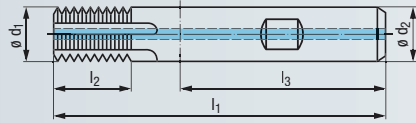
Nominal Size	ø D	P mm	ø d <sub>1</sub>	l <sub>1</sub>	inch l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	Flutes	GFI-VHM R15-HB TICN	
M 6	6	1	0.189	2 1/2	0.491	1 3/8	1/4	3	GFR15106.0060	●
M 8	8	1.25	0.246	2 1/2	0.663	1 3/8	1/4	3	GFR15106.0080	●
M 10	10	1.5	0.309	2 1/2	0.796	1 3/8	5/16	3	GFR15106.0100	●
M 12	12	1.75	0.371	3	0.997	1 9/16	3/8	3	GFR15106.0112	●

Tools for different thread pitch upon request



**Metric Shank**

For internal threads



Carbide

RH + LH

3-5 Flutes



DIN 6535



ø D



Coating

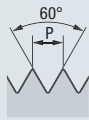
TiCN

Range of Application

- P 1.1-5.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2
- S 1.1-3

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

**M, MF**



ISO Metric threads  
DIN 13

P mm	ø D <sub>min.</sub>	ø d <sub>1</sub>	mm			ø d <sub>2</sub>	Flutes	GF-VHM IKZ-HB		GF-VHM IKZ-HB TiCN	
			l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>						
0.5	10	7.9	63	12.2	36	8	3	GF163101.9506	●	GF163106.9506	●
0.5	12	9.9	70	16.2	40	10	4	GF163211.9506	●	GF163216.9506	●
0.75	11	7.9	63	12.3	36	8	3	GF163101.9509	●	GF163106.9509	●
0.75	13	9.9	70	16.8	40	10	4	GF163211.9509	●	GF163216.9509	●
1	14	9.9	70	16.4	40	10	4	GF163211.9512	●	GF163216.9512	●
1	16	11.9	80	20.4	45	12	4	GF163121.9512	●	GF163126.9512	●
1	22	15.9	90	25.4	48	16	5	GF163131.9512	●	GF163136.9512	●
1	27	19.9	105	32.4	50	20	5	GF163151.9512	●	GF163156.9512	●
1.5	14	9.9	70	17.1	40	10	4	GF163211.9514	●	GF163216.9514	●
1.5	16	11.9	80	21.6	45	12	4	GF163121.9514	●	GF163126.9514	●
1.5	22	15.9	90	26.1	48	16	5	GF163131.9514	●	GF163136.9514	●
1.5	27	19.9	105	33.6	50	20	5	GF163151.9514	●	GF163156.9514	●
2	18	11.9	80	20.9	45	12	4	GF163121.9516	●	GF163126.9516	●
2	22	15.9	90	26.9	48	16	5	GF163131.9516	●	GF163136.9516	●
2	27	19.9	105	32.9	50	20	5	GF163151.9516	●	GF163156.9516	●
3	24	15.9	90	28.3	48	16	5	GF163131.9518	●	GF163136.9518	●
3	30	19.9	105	34.3	50	20	5	GF163151.9518	●	GF163156.9518	●

Tools for different thread pitch upon request

Product  
Finder

v<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

ZGF(I)

CIRC-GF

Gigant

MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

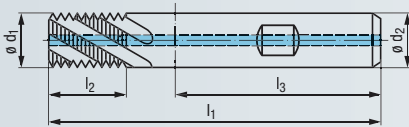
### Metric Shank

**Carbide**
**R30**
**RH + LH**
**4-5 Flutes**

**DIN 6535**

 $\varnothing D$ 


For internal threads



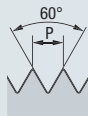
Coating

**TiCN**

Range of Application

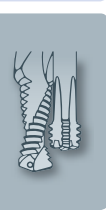
**P 1.1-3.1**
**K 1.1-4.2**
**N 1.1-5, 2.1-6, 3.1-4.2, 5.2**
**S 1.1-2**
**P 1.1-3.1**
**M 1.1-2.1**
**K 1.1-4.2**
**N 1.1-2.7, 3.1-5.2**
**S 1.1-2.2.1**

# M, MF


**ISO Metric threads  
DIN 13**
**GF-VHM  
R30-Ig-IKZ-HB**
**GF-VHM  
R30-Ig-IKZ-HB  
TiCN**

	P mm	$\varnothing D_{min.}$	$\varnothing d_1$	mm			$\varnothing d_2$	Flutes				
				$l_1$	$l_2$	$l_3$						
	1	14	9.9	80	20.4	40	10	4	GF162311.9512	●	GF162316.9512	●
	1	16	11.9	90	25.4	45	12	4	GF162321.9512	●	GF162326.9512	●
	1	22	15.9	100	32.4	48	16	5	GF162331.9512		GF162336.9512	
	1	27	19.9	115	40.4	50	20	5	GF162351.9512		GF162356.9512	
	1.5	14	9.9	80	21.6	40	10	4	GF162311.9514	●	GF162316.9514	●
	1.5	16	11.9	90	26.1	45	12	4	GF162321.9514	●	GF162326.9514	●
	1.5	22	15.9	100	33.6	48	16	5	GF162331.9514	●	GF162336.9514	●
	1.5	27	19.9	115	41.1	50	20	5	GF162351.9514	●	GF162356.9514	●
	2	18	11.9	90	26.9	45	12	4	GF162321.9516	●	GF162326.9516	●
	2	22	15.9	100	32.9	48	16	5	GF162331.9516		GF162336.9516	
	2	27	19.9	115	40.9	50	20	5	GF162351.9516		GF162356.9516	
	3	24	15.9	100	34.3	48	16	5	GF162331.9518	●	GF162336.9518	●
	3	30	19.9	115	43.3	50	20	5	GF162351.9518		GF162356.9518	

Tools for different thread pitch upon request



**Metric Shank**

Carbide

R15

RH + LH

6 Flutes



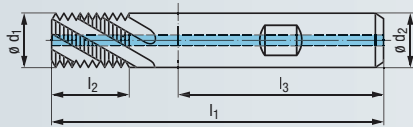
DIN 6535



ø D



For internal threads



With increased number of flutes



Coating

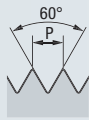
TICN

Range of Application

- P 1.1-5.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2
- S 1.1-3

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

**M, MF**



ISO Metric threads  
DIN 13

P mm	ø D <sub>min.</sub>	ø d <sub>1</sub>	mm			ø d <sub>2</sub>	Flutes	GF-Z-VHM R15-IKZ-HB		GF-Z-VHM R15-IKZ-HB TICN	
			l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>						
1	14	9.9	70	20.4	40	10	6	GF165361.9512	●	GF165366.9512	●
1.5	16	11.9	80	26.1	45	12	6	GF165371.9514	●	GF165376.9514	●
2	22	15.9	90	32.9	48	16	6	GF165381.9516	●	GF165386.9516	●
3	30	19.9	105	43.3	50	20	6	GF165391.9518	●	GF165396.9518	●

Tools for different thread pitch upon request

Product  
Finder

v<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

ZGF(I)

CIRC-GF

Gigant

MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Metric Shank

Carbide

R15

RH + LH

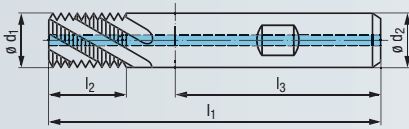
4-6 Flutes



DIN 6535



For internal threads



Variable diameter range,  
with increased number of flutes



Coating

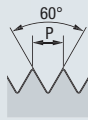
TICN

Range of Application

- P 1.1-5.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2
- S 1.1-3

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

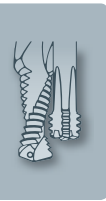
# M, MF



ISO Metric threads  
DIN 13

	P mm	ø D	ø d <sub>1</sub>	l <sub>1</sub>	mm		ø d <sub>2</sub>	Flutes	GF-VZ-VHM R15-IKZ-HB		GF-VZ-VHM R15-IKZ-HB TICN	
					l <sub>2</sub>	l <sub>3</sub>						
	1	≥ M 6	4.8	55	12.4	36	6	4	GFB35101.0060	●	GFB35106.0060	●
	1.25	≥ M 8	6.5	63	16.8	36	8	4	GFB35101.0080	●	GFB35106.0080	●
	1.5	≥ M10	8.2	70	21.7	40	10	5	GFB35101.0100	●	GFB35106.0100	●
	1.75	≥ M12	9.9	74	25.3	40	10	5	GFB35101.0112	●	GFB35106.0112	●
	2	≥ M14	11.6	85	28.9	45	12	5	GFB35101.0114	●	GFB35106.0114	●
	2.5	≥ M18	15	100	38.6	48	16	5	GFB35101.0118	●	GFB35106.0118	●
	3	≥ M24	19.9	115	49.4	50	20	6	GFB35101.0124	●	GFB35106.0124	●

Tools for different thread pitch upon request



**Metric Shank**

Carbide

R15

RH + LH

4-5 Flutes

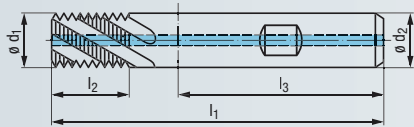
DIN 6535



ø D



For internal threads



Variable diameter range,  
with increased number of flutes



Coating

TICN

Range of Application

P 1.1-5.1

K 1.1-4.2

N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2

S 1.1-3

P 1.1-5.1

M 1.1-4.1

K 1.1-4.2

N 1.1-5.2

S 1.1-2.6

H 1.1-2

**MF**



ISO Metric fine threads  
DIN 13

P mm	ø D	ø d <sub>1</sub>	l <sub>1</sub>	mm l <sub>2</sub>	l <sub>3</sub>	ø d <sub>2</sub>	Flutes	GF-VZ-VHM R15-IKZ-HB	GF-VZ-VHM R15-IKZ-HB TICN
1	≥ M 8	6.7	63	16.4	36	8	4	GFB35101.0251 ●	GFB35106.0251 ●
1	≥ M10	8.7	70	20.4	40	10	5	GFB35101.0276 ●	GFB35106.0276 ●
1.5	≥ M16	14.1	95	33.7	48	16	5	GFB35101.0359 ●	GFB35106.0359 ●

Tools for different thread pitch upon request

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M**
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H**
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Metric Shank

Carbide

For hard materials

R10

RH + LH

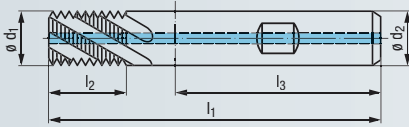
4-5 Flutes



DIN 6535



For internal threads



Coating

TICN

Range of Application

N 2.7-8

H 1.3-5

# M

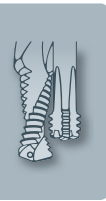


ISO Metric coarse thread  
DIN 13

GF-H-VHM  
R10-1KZ-HB  
TICN

Nominal Size	P	d <sub>1</sub>	l <sub>1</sub>	mm l <sub>2</sub>	l <sub>3</sub>	d <sub>2</sub>	Flutes	
Ø D	mm							
M 6	1	4.6	55	9.4	36	6	4	GF927126.0060
M 8	1.25	6.25	63	13.1	36	8	5	GF927126.0080
M 10	1.5	7.9	63	15.7	36	8	5	GF927126.0100
M 12	1.75	9.55	70	18.3	40	10	5	GF927126.0112
M 16	2	13.2	90	24.9	45	14	5	GF927126.0116
M 20	2.5	15.9	100	33.6	48	16	5	GF927126.0120

Tools for different thread pitch upon request





**Metric Shank**

Carbide

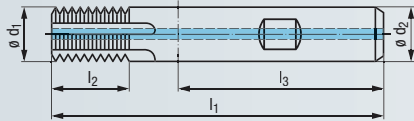
RH + LH

4-5 Flutes

DIN 6535

HB  
HE  
HA

For internal and external threads



Coating

TICN

Range of Application

- P 1.1-5.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2
- S 1.1-3

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

**G** Rp (BSPP), W



Whitworth pipe threads  
DIN EN ISO 228, DIN EN 10226-1, ISO 7/1, BS 84

T.P.I.	ø D <sub>min.</sub> <sup>1)</sup>	ø d <sub>1</sub>	inch			inch		ø d <sub>2</sub>	mm	Flutes	GF-VHM IKZ-HB		GF-VHM IKZ-HB TICN	
			l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	inch	mm							
19	1/4	0.390	2.756	0.657	1.575	0.394	10	4		GF163211.9545	●	GF163216.9545	●	
14	1/2	0.626	3.543	1.035	1.890	0.630	16	5		GF163131.9548	●	GF163136.9548	●	
14	3/4	0.783	4.134	1.319	1.969	0.787	20	5		GF163151.9548	●	GF163156.9548	●	
11	1	0.626	3.543	1.043	1.890	0.630	16	5		GF163131.9550	●	GF163136.9550	●	
11	1	0.783	4.134	1.319	1.969	0.787	20	5		GF163151.9550	●	GF163156.9550	●	

<sup>1)</sup> Diameter related to internal pipe thread resp. external pipe thread

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Metric Shank

Carbide

R30

RH + LH

4-5 Flutes

DIN 6535

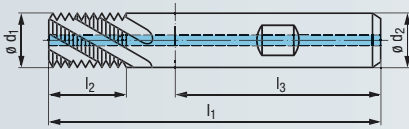


ø D

ø D



For internal and external threads



Coating

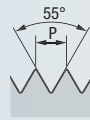
TICN

Range of Application

- P 1.1-3.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-4.2, 5.2
- S 1.1-2

- P 1.1-3.1
- M 1.1-2.1
- K 1.1-4.2
- N 1.1-2.7, 3.1-5.2
- S 1.1-2, 2.1

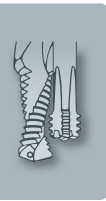
### G Rp (BSPP), W



Whitworth pipe threads  
DIN EN ISO 228, DIN EN 10226-1, ISO 7/1, BS 84

T.P.I.	ø D <sub>min.</sub> <sup>1)</sup>	ø d <sub>1</sub>	inch			inch		ø d <sub>2</sub>	Flutes	GF-VHM R30-IKZ-HB		GF-VHM R30-IKZ-HB TICN	
			l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	inch	mm						
19	1/4	0,390	2,756	0,657	1,575	0,394	10	4	GF162211.9545	●	GF162216.9545	●	
14	1/2	0,469	3,150	0,823	1,772	0,472	12	4	GF162121.9548	●	GF162126.9548	●	
14	1/2	0,626	3,543	1,035	1,890	0,630	16	5	GF162131.9548	●	GF162136.9548	●	
14	3/4	0,783	4,134	1,319	1,969	0,787	20	5	GF162151.9548	●	GF162156.9548	●	
11	1	0,626	3,543	1,043	1,890	0,630	16	5	GF162131.9550	●	GF162136.9550	●	
11	1	0,783	4,134	1,319	1,969	0,787	20	5	GF162151.9550	●	GF162156.9550	●	

<sup>1)</sup> Diameter related to internal pipe thread resp. external pipe thread



**Metric Shank**

Carbide

R30

RH + LH

3-5 Flutes

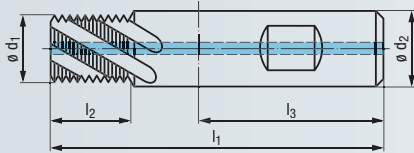
DIN 6535



ø D



For internal threads



**NPSF**



**American Standard straight pipe thread  
ANSI B1.20.3**

dryseal internal straight pipe thread for fuel,  
combined with external tapered pipe thread NPTF  
or PTF-SAE-SHORT; Gauge with tapered gauges

Coating

TICN

Range of Application

- P 1.1-3.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-4.2, 5.2
- S 1.1-2

- P 1.1-3.1
- M 1.1-2.1
- K 1.1-4.2
- N 1.1-2.7, 3.1-5.2
- S 1.1-2, 2.1

Nominal Size ø D	T.P.I.	ø d <sub>1</sub>	inch			inch		ø d <sub>2</sub> mm	Flutes
			l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	inch			
1/16	27	0.232	2.480	0.424	1.417	0.315	8	3	
1/8	27	0.301	2.480	0.424	1.417	0.315	8	3	
1/4	18	0.400	3.145	0.637	1.772	0.472	12	4	
3/8	18	0.439	3.145	0.637	1.772	0.472	12	4	
1/2	14	0.561	3.543	0.819	1.890	0.630	16	4	
3/4	14	0.561	3.543	0.819	1.890	0.630	16	4	
1	11 1/2	0.772	4.134	1.000	1.969	0.787	20	5	

GF-VHM  
R30-IKZ-HB

GF-VHM  
R30-IKZ-HB  
TICN

GF172101.5904		GF172106.5904	
GF172101.5905	●	GF172106.5905	●
GF172111.5906	●	GF172116.5906	●
GF172111.5907	●	GF172116.5907	●
GF172131.5908	●	GF172136.5908	●
GF172131.5909		GF172136.5909	
GF172151.5910		GF172156.5910	

NPSF cutters are manufactured with a corrected profile

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



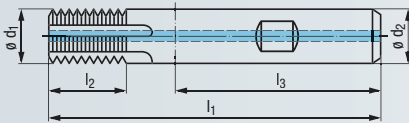
- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Metric Shank

**Carbide**
**RH + LH**
**4-5 Flutes**

**DIN 6535**


For internal threads



Coating

**TICN**

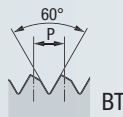
Range of Application

- P 1.1-5.1**
- K 1.1-4.2**
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2**
- S 1.1-3**

- P 1.1-5.1**
- M 1.1-4.1**
- K 1.1-4.2**
- N 1.1-5.2**
- S 1.1-2.6**
- H 1.1-2**

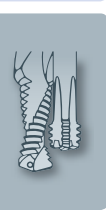
# LK-M

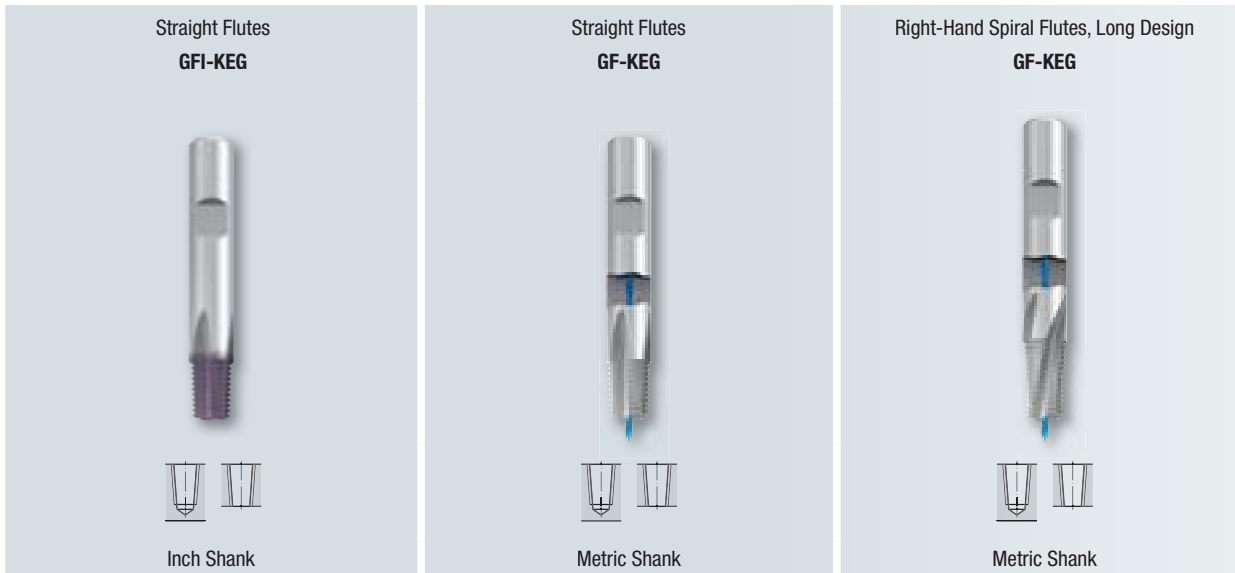
# LK-MF


**Metric SELF-LOCK threads**  
**EMUGE standard**
**GF-VHM**  
**IKZ-HB**
**GF-VHM**  
**IKZ-HB**  
**TICN**

	P mm	ø D <sub>min.</sub>	ø d <sub>1</sub>	mm			ø d <sub>2</sub>	Flutes				
				l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>						
<b>GF(I), GF-Z</b>	<b>1</b>	14	9.9	70	16.4	40	10	4	<b>GF163211.9757</b>	●	<b>GF163216.9757</b>	●
	<b>1</b>	16	11.9	80	20.4	45	12	4	<b>GF163121.9757</b>	●	<b>GF163126.9757</b>	●
<b>GF-Vario-Z</b>	<b>1.5</b>	14	9.9	70	17	40	10	4	<b>GF163211.9664</b>	●	<b>GF163216.9664</b>	●
	<b>1.5</b>	16	11.9	80	21.5	45	12	4	<b>GF163121.9664</b>	●	<b>GF163126.9664</b>	●
<b>GF-H</b>	<b>2</b>	22	15.9	90	26.7	48	16	5	<b>GF163131.9705</b>	●	<b>GF163136.9705</b>	●
<b>GF(I)-KEG</b>	<b>3</b>	30	19.9	105	34.1	50	20	5	<b>GF163151.9767</b>	●	<b>GF163156.9767</b>	●

Tools for different thread pitch upon request





236	Page 237	238	<b>NPT</b>
	239	240	<b>NPTF</b>
	241		<b>Rc (BSPT)</b>

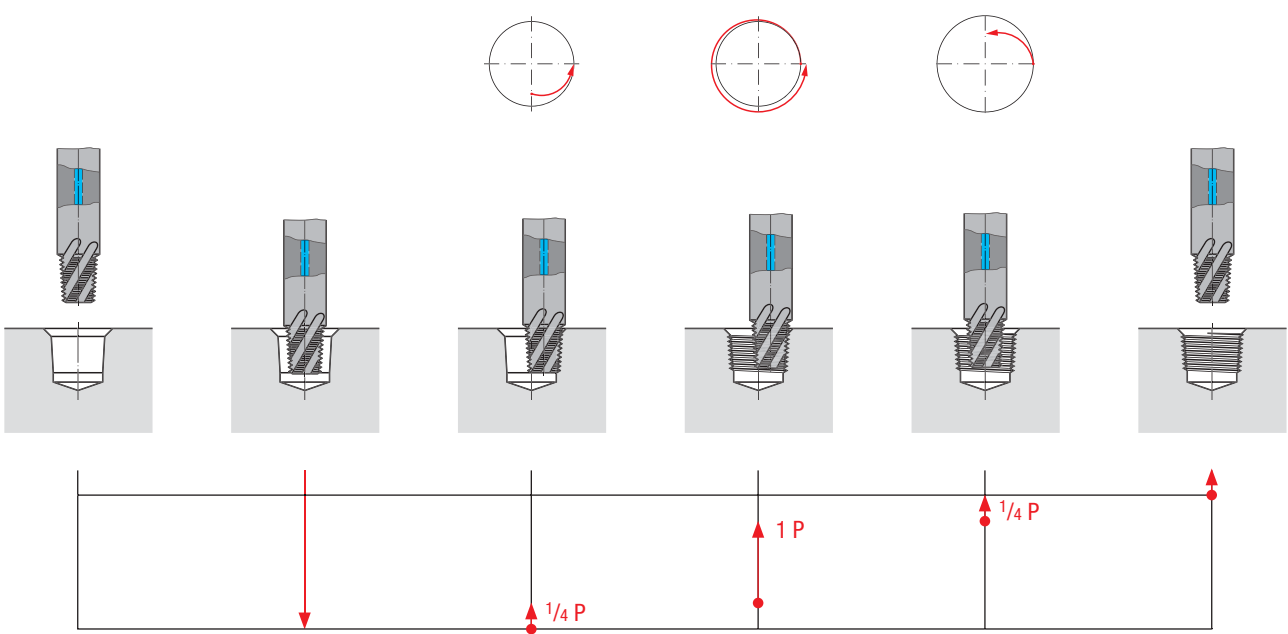
- Product Finder
- $v_c$
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG**
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

**Possible modifications**



For a description of these modifications, see page 279

**Thread milling cycle**



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT**
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GFI-KEG**
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Inch Shank

Carbide

Without internal coolant supply (IKZ)

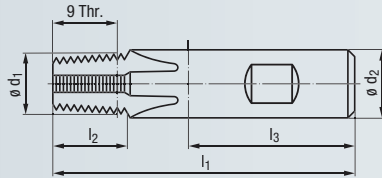
RH + LH

3-5 Flutes

ASME B94.19



For internal tapered threads



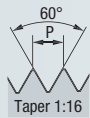
Coating

TICN

Range of Application

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

# NPT



American tapered pipe thread, ANSI/ASME B1.20.1 for threads with dryseal material, taper 1:16

Nominal Size ø D	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch l <sub>3</sub>	ø d <sub>1</sub>	ø d <sub>2</sub>	Flutes	GFI-KEG-VHM HB TICN
1/16	27	2 1/4	0.389	1 3/8	0.232	5/16	3	GFT53106.5763
1/8	27	2 1/4	0.389	1 3/8	0.301	5/16	3	GFT53106.5764
1/4	18	3 1/4	0.583	1 25/32	0.400	1/2	4	GFT53116.5765
3/8	18	3 1/4	0.583	1 25/32	0.439	1/2	4	GFT53116.5766
1/2	14	3 1/2	0.750	1 29/32	0.561	5/8	4	GFT53136.9678
3/4	14							
1	11 1/2	3 3/4	0.913	2 1/32	0.772	3/4	5	GFT53156.9679
1 1/4	11 1/2							
1 1/2	11 1/2							
2	11 1/2							

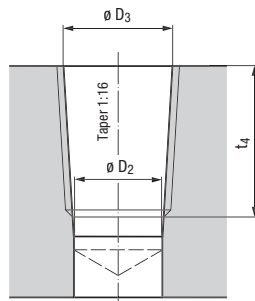
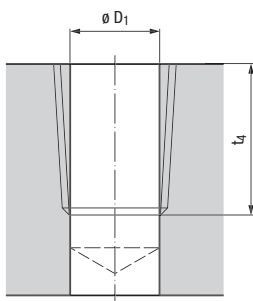
NPT cutters are manufactured with a corrected profile

Application recommendation: You must have an NC program for a spiral formed helix to prevent a profile step

### Thread hole diameters for tapered pipe thread NPT, taper 1:16

A) Drill cylindrically without using a reamer

B) Drill cylindrically and prepare tapered hole with reamer



Nominal size ø D	T.P.I.	ø D <sub>1</sub>	ø D <sub>2</sub>	inch ø D <sub>3</sub> (+0.002)	t <sub>4</sub>
1/16	27	0.2421	0.2343	0.2516	0.3268
1/8	27	0.3346	0.3268	0.3441	0.3268
1/4	18	0.4331	0.4232	0.4472	0.4783
3/8	18	0.5669	0.5571	0.5827	0.4902
1/2	14	0.7008	0.6870	0.7213	0.6417
3/4	14	0.9114	0.8976	0.9319	0.6417
1	11 1/2	1.1437	1.1280	1.1689	0.7697
1 1/4	11 1/2	1.4882	1.4705	1.5138	0.7894
1 1/2	11 1/2	1.7264	1.7106	1.7528	0.7894
2	11 1/2	2.1988	2.1831	2.2268	0.8051

**Metric Shank**

Carbide

RH + LH

3-5 Flutes

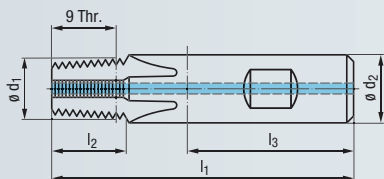
DIN 6535

HB  
HE  
HA

$\phi D$



For internal tapered threads



Coating

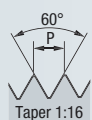
TICN

Range of Application

- P 1.1-5.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2
- S 1.1-3

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

**NPT**



**American tapered pipe thread,  
ANSI/ASME B1.20.1**  
for threads with dryseal material,  
taper 1:16

Nominal Size	T.P.I.	$l_1$	$l_2$	$l_3$	$\phi d_1$	$\phi d_2$	Flutes
$\phi D$		inch	inch	inch	inch	mm	
1/16	27	2.165	0.389	1.417	0.232	0.315	3
1/8	27	2.165	0.389	1.417	0.301	0.315	3
1/4	18	2.953	0.582	1.772	0.400	0.472	4
3/8	18	2.953	0.582	1.772	0.439	0.472	4
1/2	14	3.150	0.748	1.890	0.561	0.630	4
3/4	14						
1	11 1/2	3.543	0.911	1.969	0.772	0.787	5
1 1/4	11 1/2						
1 1/2	11 1/2						
2	11 1/2						

GF-KEG-VHM  
IKZ-HB

GF-KEG-VHM  
IKZ-HB  
TICN

GF173101.5763	●	GF173106.5763	●
GF173101.5764	●	GF173106.5764	●
GF173111.5765	●	GF173116.5765	●
GF173111.5766	●	GF173116.5766	●
GF173131.9678	●	GF173136.9678	●
GF173151.9679	●	GF173156.9679	●

NPT cutters are manufactured with a corrected profile

Application recommendation: You must have an NC program for a spiral formed helix to prevent a profile step

- Product Finder
- $v_c$
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT**
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF-KEG**
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT**
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF-KEG**
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Metric Shank

Carbide

R15

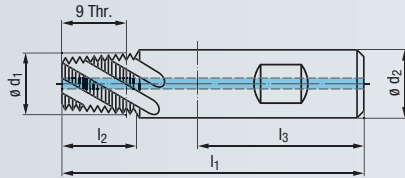
RH + LH

3-5 Flutes

DIN 6535



For internal tapered threads



Coating

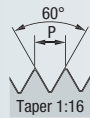
TICN

Range of Application

- P 1.1-5.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2
- S 1.1-3

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

## NPT (API-LP)



American tapered pipe thread,  
ANSI/ASME B1.20.1  
for threads with dryseal material,  
taper 1:16

Nominal Size ø D	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			ø d <sub>1</sub>	ø d <sub>2</sub>		Flutes
				l <sub>3</sub>	inch	mm		inch	mm	
1/16	27	2.362	0.537	1.417	0.232	0.315	8	3		
1/8	27	2.362	0.537	1.417	0.301	0.315	8	3		
1/4	18	3.150	0.805	1.772	0.400	0.472	12	4		
3/8	18	3.150	0.804	1.772	0.439	0.472	12	4		
1/2	14	3.346	1.034	1.890	0.561	0.630	16	4		
3/4	14									
1	11 1/2	3.740	1.259	1.969	0.772	0.787	20	5		
1 1/4	11 1/2									
1 1/2	11 1/2									
2	11 1/2									

GF-KEG-VHM  
R15-Ig-IKZ-HB

GF-KEG-VHM  
R15-Ig-IKZ-HB  
TICN

GF175301.5763	●	GF175306.5763	●
GF175301.5764	●	GF175306.5764	●
GF175311.5765	●	GF175316.5765	●
GF175311.5766	●	GF175316.5766	●
GF175331.9678	●	GF175336.9678	●
GF175351.9679	●	GF175356.9679	●

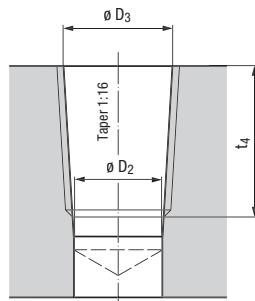
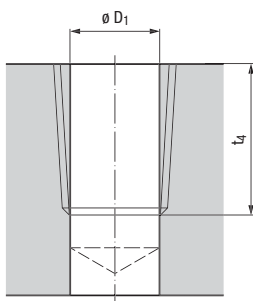
NPT/API-LP cutters are manufactured with a corrected profile

Application recommendation: You must have an NC program for a spiral formed helix to prevent a profile step

### Thread hole diameters for tapered pipe thread NPT, taper 1:16

A) Drill cylindrically  
without using a reamer

B) Drill cylindrically and prepare  
tapered hole with reamer

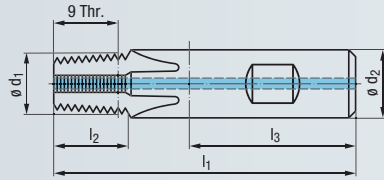


Nominal size ø D	T.P.I.	inch			
		ø D <sub>1</sub>	ø D <sub>2</sub>	ø D <sub>3</sub> (+0.002)	t <sub>4</sub>
1/16	27	0.2421	0.2343	0.2516	0.3268
1/8	27	0.3346	0.3268	0.3441	0.3268
1/4	18	0.4331	0.4232	0.4472	0.4783
3/8	18	0.5669	0.5571	0.5827	0.4902
1/2	14	0.7008	0.6870	0.7213	0.6417
3/4	14	0.9114	0.8976	0.9319	0.6417
1	11 1/2	1.1437	1.1280	1.1689	0.7697
1 1/4	11 1/2	1.4882	1.4705	1.5138	0.7894
1 1/2	11 1/2	1.7264	1.7106	1.7528	0.7894
2	11 1/2	2.1988	2.1831	2.2268	0.8051



**Metric Shank**

For internal tapered threads



Carbide

RH + LH

3-5 Flutes



DIN 6535



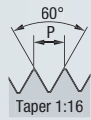
Coating

Range of Application



TICN

**NPTF**



**American tapered pipe thread, ANSI B1.20.3**  
for threads **without dryseal material**, taper 1:16

Nominal Size $\theta D$	T.P.I.	$l_1$	$l_2$	$l_3$	$\theta d_1$	$\theta d_2$	Flutes
		inch			inch	mm	
1/16	27	2.165	0.387	1.417	0.232	0.315	3
1/8	27	2.165	0.387	1.417	0.301	0.315	3
1/4	18	2.953	0.581	1.772	0.400	0.472	4
3/8	18	2.953	0.581	1.772	0.439	0.472	4
1/2	14	3.150	0.748	1.890	0.561	0.630	4
3/4	14	3.150	0.748	1.890	0.561	0.630	4
1	11 1/2	3.543	0.911	1.969	0.772	0.787	5
1 1/4	11 1/2						
1 1/2	11 1/2						
2	11 1/2						

GF-KEG-VHM  
IKZ-HB

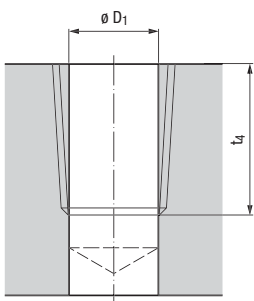
GF-KEG-VHM  
IKZ-HB  
TICN

NPTF cutters are manufactured with a corrected profile

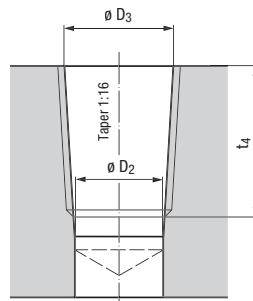
Application recommendation: You must have an NC program for a spiral formed helix to prevent a profile step

**Thread hole diameters for tapered pipe thread NPTF, taper 1:16**

A) Drill cylindrically without using a reamer



B) Drill cylindrically and prepare tapered hole with reamer



Nominal size $\theta D$	T.P.I.	$\theta D_1$	$\theta D_2$	$\theta D_3$	$t_4$
		inch			
		(+0.002)			
1/16	27	0.2402	0.2343	0.2524	0.3268
1/8	27	0.3327	0.3268	0.3449	0.3268
1/4	18	0.4291	0.4232	0.4488	0.4783
3/8	18	0.5630	0.5571	0.5843	0.4902
1/2	14	0.6929	0.6870	0.7217	0.6417
3/4	14	0.9055	0.8976	0.9323	0.6417
1	11 1/2	1.1319	1.1280	1.1701	0.7697
1 1/4	11 1/2	1.4764	1.4705	1.5150	0.7894
1 1/2	11 1/2	1.7224	1.7106	1.7539	0.7894
2	11 1/2	2.1949	2.1831	2.2280	0.8051

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF-KEG**
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF**
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF-KEG**
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### Metric Shank

Carbide

R15

RH + LH

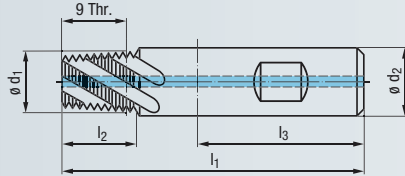
3-5 Flutes

DIN 6535

HB  
HE  
HA

Ø D

For internal tapered threads



Coating

TICN

Range of Application

- P 1.1-5.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2
- S 1.1-3

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

# NPTF



American tapered pipe thread,  
ANSI B1.20.3  
for threads **without dryseal material**,  
taper 1:16

Nominal Size Ø D	T.P.I.	l <sub>1</sub>	l <sub>2</sub>	inch			Ø d <sub>1</sub>	Ø d <sub>2</sub>		Flutes
				l <sub>3</sub>	inch	mm		inch	mm	
1/16	27	2.362	0.535	1.417	0.232	0.315	8	3		
1/8	27	2.362	0.535	1.417	0.301	0.315	8	3		
1/4	18	3.150	0.804	1.772	0.400	0.472	12	4		
3/8	18	3.150	0.803	1.772	0.439	0.472	12	4		
1/2	14	3.346	1.033	1.890	0.561	0.630	16	4		
3/4	14	3.346	1.033	1.890	0.561	0.630	16	4		
1	11 1/2	3.740	1.258	1.969	0.772	0.787	20	5		
1 1/4	11 1/2									
1 1/2	11 1/2									
2	11 1/2									

GF-KEG-VHM  
R15-Ig-IKZ-HB

GF-KEG-VHM  
R15-Ig-IKZ-HB  
TICN

GF175301.5782	●	GF175306.5782	●
GF175301.5783	●	GF175306.5783	●
GF175311.5784	●	GF175316.5784	●
GF175311.5785	●	GF175316.5785	●
GF175331.5786	●	GF175336.5786	●
GF175331.5787	●	GF175336.5787	●
GF175351.9684	●	GF175356.9684	●

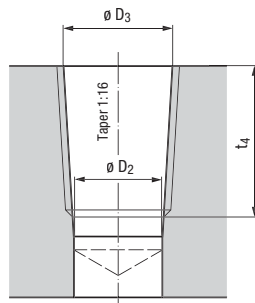
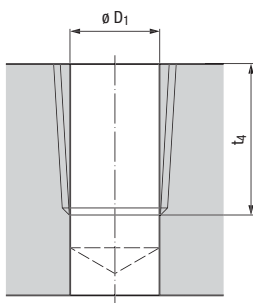
NPTF cutters are manufactured with a corrected profile

Application recommendation: You must have an NC program for a spiral formed helix to prevent a profile step

### Thread hole diameters for tapered pipe thread NPTF, taper 1:16

A) Drill cylindrically  
without using a reamer

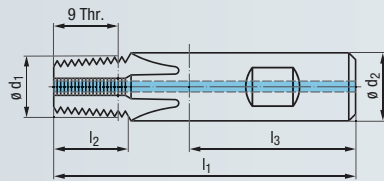
B) Drill cylindrically and prepare  
tapered hole with reamer



Nominal size Ø D	T.P.I.	inch			t <sub>4</sub>
		Ø D <sub>1</sub>	Ø D <sub>2</sub>	Ø D <sub>3</sub> (+0.002)	
1/16	27	0.2402	0.2343	0.2524	0.3268
1/8	27	0.3327	0.3268	0.3449	0.3268
1/4	18	0.4291	0.4232	0.4488	0.4783
3/8	18	0.5630	0.5571	0.5843	0.4902
1/2	14	0.6929	0.6870	0.7217	0.6417
3/4	14	0.9055	0.8976	0.9323	0.6417
1	11 1/2	1.1319	1.1280	1.1701	0.7697
1 1/4	11 1/2	1.4764	1.4705	1.5150	0.7894
1 1/2	11 1/2	1.7224	1.7106	1.7539	0.7894
2	11 1/2	2.1949	2.1831	2.2280	0.8051

**Metric Shank**

For internal tapered threads



Carbide

RH + LH

3-5 Flutes



DIN 6535



**RC (BSPT)**

**Tapered Whitworth pipe thread, DIN EN ISO 10226-2 and ISO 7-1**  
where pressure-tight joints are made on the threads, taper 1:16



Coating

TiCN

Range of Application

- P 1.1-5.1
- K 1.1-4.2
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2
- S 1.1-3

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

Nominal Size $\varnothing D$	T.P.I.	$l_1$	$l_2$ inch	$l_3$	$\varnothing d_1$		Flutes	GF-KEG-VHM IKZ-HB	GF-KEG-VHM IKZ-HB TiCN	
					inch	mm				
1/16	28	2.165	0.337	1.417	0.232	0.315	8	3	GF173101.4114 GF173101.4115	GF173106.4114 GF173106.4115
1/8	28	2.165	0.337	1.417	0.301	0.315	8	3	GF173111.4116 GF173111.4117	GF173116.4116 GF173116.4117
1/4	19	2.953	0.550	1.772	0.400	0.472	12	4	GF173131.9561	GF173136.9561
3/8	19	2.953	0.549	1.772	0.439	0.472	12	4		
1/2	14	3.150	0.750	1.890	0.561	0.630	16	4		
3/4	14									
1	11	3.543	0.955	1.969	0.772	0.787	20	5	GF173151.9562	GF173156.9562
1 1/4	11									
1 1/2	11									

Rc cutters are manufactured with a corrected profile

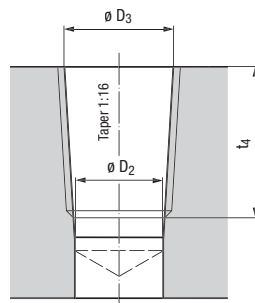
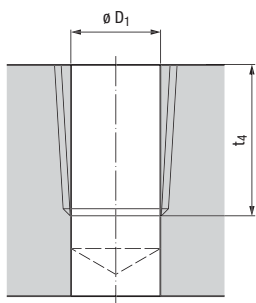
Application recommendation: You must have an NC program for a spiral formed helix to prevent a profile step

**Thread hole diameters for tapered pipe thread Rc (BSPT), taper 1:16**

Hole type A) can be used when there is no reason to worry about sealing problems

A) Drill cylindrically without using a reamer

B) Drill cylindrically and prepare tapered hole with reamer



Nominal size $\varnothing D$	T.P.I.	$\varnothing D_1$	$\varnothing D_2$	$\varnothing D_3$ (JS11)	$t_4$
1/16	28	0.2421	0.2402	0.2583	0.3091
1/8	28	0.3209	0.3189	0.3374	0.3091
1/4	19	0.4272	0.4232	0.4508	0.4587
3/8	19	0.5630	0.5610	0.5886	0.4744
1/2	14	0.7008	0.6969	0.7335	0.6260
3/4	14	0.9134	0.9094	0.9496	0.6594
1	11	1.1496	1.1457	1.1925	0.7736
1 1/4	11	1.4882	1.4803	1.5335	0.8642
1 1/2	11	1.7205	1.7126	1.7657	0.8642

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF-KEG**
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



Product  
Finder

V<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

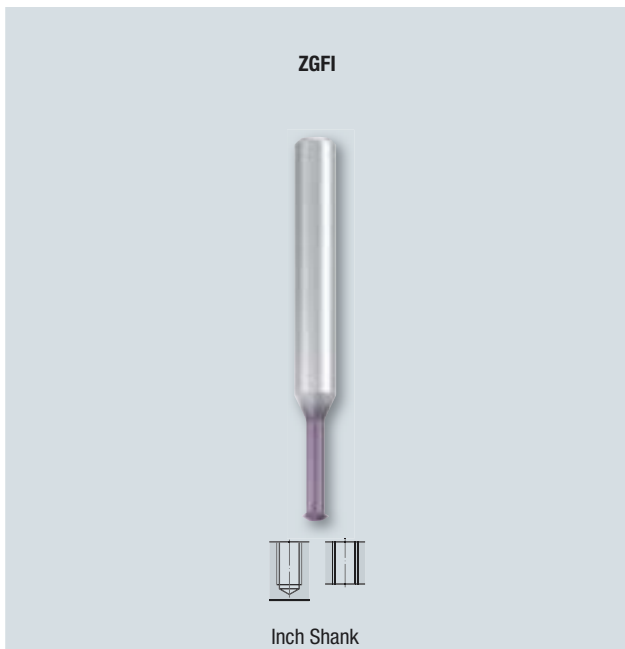
ZGF(I)

CIRC-GF

Gigant

MoSys





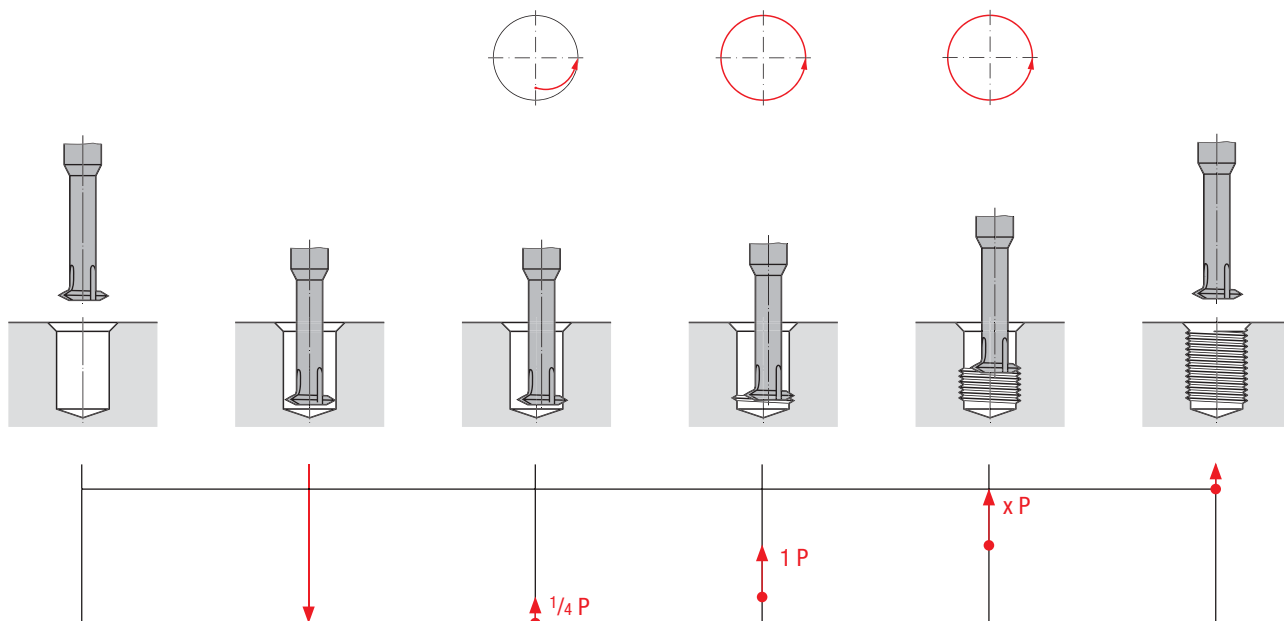
Page

244 - 245	
245	
247	246

<b>UNC</b>
<b>UNF</b>
<b>M, MF</b>
<b>STI-UNC</b>

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)**
- CIRC-GF
- Gigant
- MoSys

**Thread milling cycle**



- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGFI
- CIRC-GF
- Gigant
- MoSys

### Inch Shank

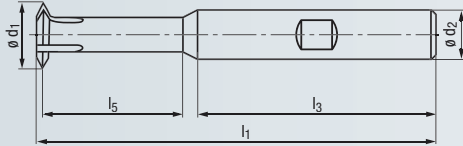
Carbide

RH + LH

3 Flutes

ASME B94.19

For internal threads



**UNC**

**Unified coarse thread**  
**ASME B1.1**

Coating

TICN

Range of Application

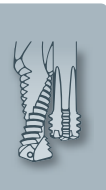
- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

Thread Depth

**2 x D**

Nominal Size ø D	T.P.I.	l <sub>1</sub>	l <sub>3</sub>	inch l <sub>5</sub>	ø d <sub>1</sub>	ø d <sub>2</sub>	Flutes	ZGFI-VHM	
								2xD HA TICN	2xD HB TICN
No. 1	64	1 5/8	1.094	0.157	0.056	1/8	3	GFS23706.5000	●
No. 2	56	1 5/8	1.094	0.181	0.065	1/8	3	GFS23706.5001	●
No. 4	40	1 5/8	1.094	0.237	0.081	1/8	3	GFS23706.5003	●
No. 5	40	1 5/8	1.094	0.260	0.094	1/8	3	GFS23706.5004	●
No. 6	32	1 5/8	1.094	0.287	0.100	1/8	3	GFS23706.5005	●
No. 8	32	1 5/8	1.094	0.339	0.122	1/8	3	GFS23706.5006	●
No. 10	24	2 1/2	1.374	0.404	0.136	1/4	3		GFS23106.5007 ●
1/4	20	2 1/2	1.374	0.528	0.185	1/4	3		GFS23106.5009 ●

Other sizes upon request



**Inch Shank**

Carbide

RH + LH

4-6 Flutes



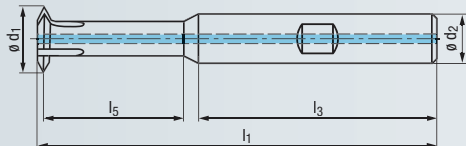
ASME B94.19



ø D



For internal threads



Coating

TICN

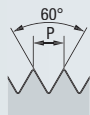
Range of Application

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

Thread Depth

**2 x D**

**UNC, UNF**



Unified threads  
ASME B1.1

Nominal Size ø D	T.P.I.	l <sub>1</sub>	l <sub>3</sub>	inch l <sub>5</sub>	ø d <sub>1</sub>	ø d <sub>2</sub>	Flutes	ZGFI-VHM 2xD IKZ-HB TICN		
5/16	18 - 24	2 1/2	1.374	0.642	0.242	1/4	4	GFS33106.5010	●	
3/8	16 - 24	2 1/2	1.374	0.776	0.301	5/16	5	GFS33106.5011	●	
7/16	14 - 20	3	1.563	0.909	0.354	3/8	5	GFS33106.5012	●	
1/2	13 - 20	3 3/4	1.780	1.024	0.407	1/2	5	GFS33106.5013	●	
5/8	11 - 18	3 3/4	1.780	1.291	0.512	1/2	5	GFS33106.5015	●	
3/4	10 - 16	4 1/4	1.906	1.543	0.630	5/8	6	GFS33106.5016	●	

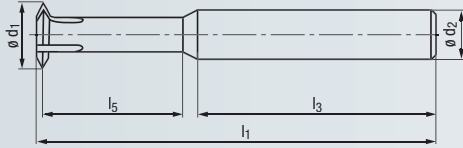
Other sizes upon request

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGFI
- CIRC-GF
- Gigant
- MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M**
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF**
- CIRC-GF
- Gigant
- MoSys

## Metric Shank

**Carbide**
**RH + LH**
**1-5 Flutes**
**DIN 6535**
**HA**
**For internal threads**


Coating

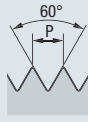
**TICN**

Range of Application

- P 1.1-5.1**
- K 1.1-4.2**
- N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.2**
- S 1.1-3**

- P 1.1-5.1**
- M 1.1-4.1**
- K 1.1-4.2**
- N 1.1-5.2**
- S 1.1-2.6**
- H 1.1-2**

# M, MF

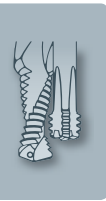

**ISO Metric threads  
DIN 13**

Thread Depth

## 2 x D

Nominal Size ø D	P <sub>max.</sub>	l <sub>1</sub>	mm			ø d <sub>1</sub>	ø d <sub>2</sub>	Flutes	ZGF-VHM 2xD HA	
			l <sub>3</sub>	l <sub>5</sub>					ZGF-VHM 2xD HA TICN	
M 1 - M 1.2	0.25	39	28	3.1	0.7	3	1	GF243701.0010	● GF243706.0010 ●	
M 1.4 - M 1.8	0.35	39	28	3.5	1.04	3	2	GF253701.0014	● GF253706.0014 ●	
M 2 - M 2.3	0.45	39	28	4.8	1.52	3	3	GF253701.0020	● GF253706.0020 ●	
M 2.5 - M 3	0.5	39	28	6	1.95	3	3	GF253701.0025	● GF253706.0025 ●	
M 3.5 - M 4.5	0.75	42	28	9	2.78	4	3	GF253701.0035	● GF253706.0035 ●	
M 5 - M 7	1	55	36	14	4	6	4	GF253701.0050	● GF253706.0050 ●	
M 8 - M10 <sup>1)</sup>	1.5	62	36	19.8	6.5	8	5	GF253701.0080	● GF253706.0080 ●	
M12 - M16 <sup>1)</sup>	2	78	40	31.8	9.9	10	5	GF253701.0112	● GF253706.0112 ●	

Other sizes upon request

<sup>1)</sup> Design with internal coolant supply (IKZ)




**Inch Shank**

Carbide

RH + LH

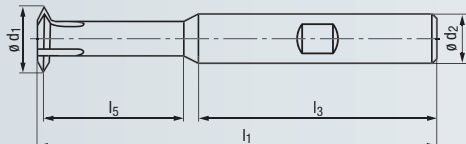
1-4 Flutes



ASME B94.19



For internal threads



Coating

TICN

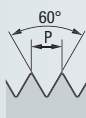
Range of Application

- P 1.1-5.1
- M 1.1-4.1
- K 1.1-4.2
- N 1.1-5.2
- S 1.1-2.6
- H 1.1-2

Thread Depth

**2 x D**

**STI-UNC**



Unified coarse thread  
ASME B18.29.1  
for wire thread inserts

Nominal Size ø D	T.P.I.	l <sub>1</sub>	l <sub>3</sub>	inch l <sub>5</sub>	ø d <sub>1</sub>	ø d <sub>2</sub>	Flutes
STI-No. 4	40	1 5/8	1.094	0.291	0.117	1/8	3
STI-No. 6	32	2 1/2	1.374	0.366	0.143	1/4	3
STI-No. 8	32	2 1/2	1.374	0.417	0.167	1/4	3

ZGFI-VHM 2xD HA TICN	ZGFI-VHM 2xD HB TICN
GFS23706.5611	GFS23106.5613
	GFS23106.5614

Other sizes upon request

- Product Finder
- Vc
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- P
- NPTF
- Rc (BSPT)
- STI**
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGFI**
- CIRC-GF
- Gigant
- MoSys



Product  
Finder

V<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

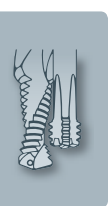
GF(I)-KEG


ZGF(I)







CIRC-GF

Gigant

MoSys



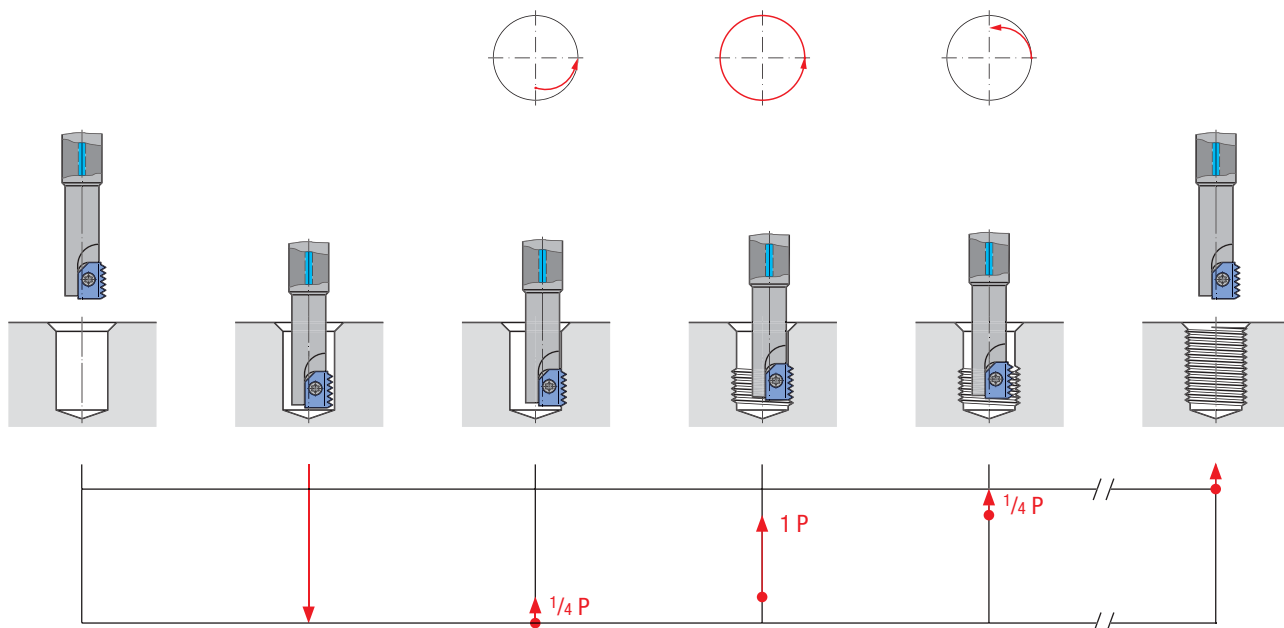
<p>Circular Thread Milling Bodies with 1 Insert 15 mm</p> <p><b>CIRC-GF</b></p> 	<p>Circular Thread Milling Bodies with 2 Inserts 15 mm</p> <p><b>CIRC-GF</b></p> 	<p>Circular Thread Milling Bodies with 1 Insert 26 mm</p> <p><b>CIRC-GF</b></p> 	<p>Circular Thread Milling Bodies with Indexable Infeed Insert „3-Tooth”</p> <p><b>CIRC-GF 1)</b></p> 
Page			
250	250	252	253

<p>Standard Inserts 15 mm</p>  	<p>Long Inserts 26 mm</p>  	<p>Indexable Infeed Inserts, “3-Tooth” Design</p>  	
Page			
251			
251		252	
251	251	252	252

<b>UN</b>
<b>M, MF</b>
<b>G BSW, BSF, W</b>

1) Thread milling cycle corresponding to that of the Gigant design, see page 255

**Thread milling cycle**



- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF**
- Gigant
- MoSys



Product Finder

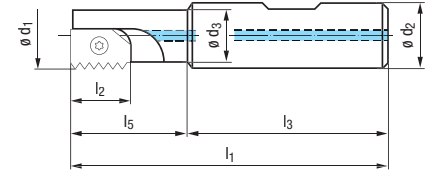
### Design for 1 standard insert 15 mm

**DIN 1835 B**



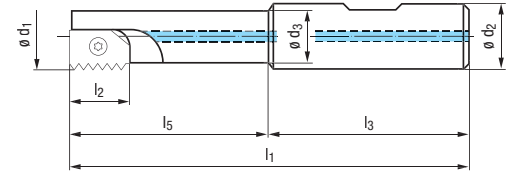

#### Short design

P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm l <sub>5</sub>	ø d <sub>1</sub>	ø d <sub>2</sub> h6	ø d <sub>3</sub>	CIRC-GF 15 mm-Z1 IKZN
0.5 - 2.5	78	15	48	30	16	16	13	<b>GZ301110</b> ●



#### Long design

P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm l <sub>5</sub>	ø d <sub>1</sub>	ø d <sub>2</sub> h6	ø d <sub>3</sub>	CIRC-GF 15 mm-Z1 IKZN
0.5 - 2.5	98	15	48	50	16	16	13	<b>GZ301310</b> <sup>2)</sup> ●
0.5 - 2.5	110	15	50	60	20	20	17	<b>GZ301320</b> ●
3 - 3.5 <sup>1)</sup>	110	15	50	60	22	20	17	<b>GZ301340</b> ●



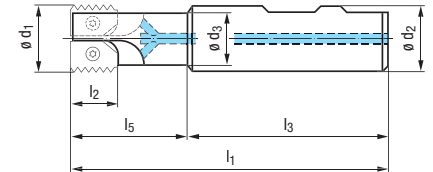
### Design for 2 standard inserts 15 mm

**DIN 1835 B**



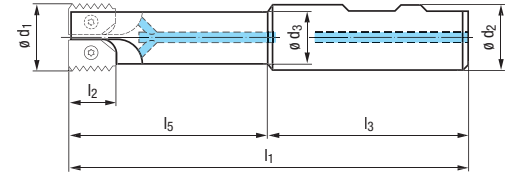

#### Short design

P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm l <sub>5</sub>	ø d <sub>1</sub>	ø d <sub>2</sub> h6	ø d <sub>3</sub>	CIRC-GF 15 mm-Z2 IKZN
0.5 - 2.5	106	15	56	50	25	25	21	<b>GZ301130</b> ●
3 - 3.5 <sup>1)</sup>	106	15	56	50	27	25	21	<b>GZ301140</b> ●

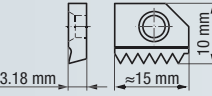


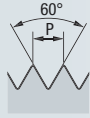
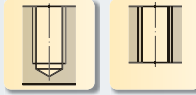
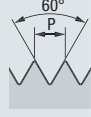
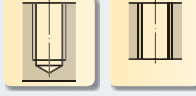
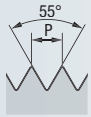
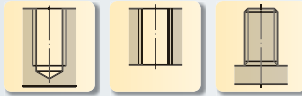


#### Long design

P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm l <sub>5</sub>	ø d <sub>1</sub>	ø d <sub>2</sub> h6	ø d <sub>3</sub>	CIRC-GF 15 mm-Z2 IKZN
0.5 - 2.5	150	15	56	94	25	25	21	<b>GZ301330</b> <sup>2)</sup> ●



1) Reinforced design  
2) Of vibration-absorbing heavy metal

		Standard inserts 15 mm  	
		Coating	
		Range of Application	
T.P.I.	P mm	HM-FP-Z1 15 mm	HM-FP-Z1 15 mm TIALN-T4
<b>UN</b>  Unified threads ASME B1.1		For internal threads 	
20		GF603111.9580	●
16		GF603111.9582	●
14		GF603111.9583	●
12		GF603111.9585	●
<b>M, MF</b>  ISO Metric threads DIN 13		For internal threads 	
	0.5	GF603111.9506	●
	0.75	GF603111.9509	●
	1	GF603111.9512	●
	1.25	GF603111.9513	●
	1.5	GF603111.9514	●
	1.75	GF603111.9515	●
	2	GF603111.9516	●
	2.5	GF603111.9517	●
	3 <sup>1)</sup>	GF603111.9518	●
	3.5 <sup>1)</sup>	GF603111.9519	●
<b>G</b>  BSW, BSF, W Whitworth pipe threads DIN EN ISO 228, BS 84		For internal and external threads 	
	14	GF603111.9548	●
	11	GF603111.9550	●

Product Finder
Vc
UNC
UNF
UN
M
MF
NPSF
G
Rp (BSPP)
W
BSW, BSF
PT
NPTF
Rc (BSPT)
STI
SELF-LOCK
Accessories
Tech. Info
BGF
ZBGF
GSF (Aero)
GSF-Z
GF(I), GF-Z
GF-Vario-Z
GF-H
GF(I)-KEG
ZGF(I)
<b>CIRC-GF</b>
Gigant
MoSys



1) Reinforced design

Accessories

-  **GZ309010** Spare screw M4 x 7; Torx T15
-  **GZ309020** Screw driver Torx T15

- Product Finder
- Vc
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

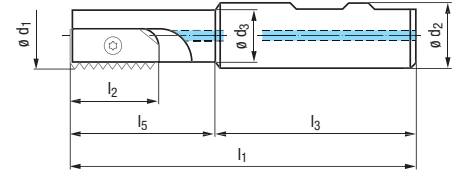
Design for 1 long insert 26 mm

**DIN 1835 B**




Short design

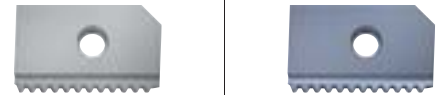
P mm	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	mm l <sub>5</sub>	ø d <sub>1</sub>	ø d <sub>2</sub> h <sub>6</sub>	ø d <sub>3</sub>	CIRC-GF 26 mm-Z1 IKZN
1 - 4	107	26	56	48	25	25	20	<b>GZ303010</b>



Carbide

RH + LH

Long inserts 26 mm



Coating		Range of Application	
TIALN-T4		<ul style="list-style-type: none"> <li><span style="background-color: #4a90e2; padding: 2px;">P 1.1-5.1</span></li> <li><span style="background-color: #ff7f50; padding: 2px;">K 1.1-4.2</span></li> <li><span style="background-color: #90ee90; padding: 2px;">N 1.1-5, 2.1-6, 3.1-4.2, 5.2</span></li> <li><span style="background-color: #ff8c00; padding: 2px;">S 1.1-3</span></li> </ul>	<ul style="list-style-type: none"> <li><span style="background-color: #4a90e2; padding: 2px;">P 1.1-5.1</span></li> <li><span style="background-color: #ffff00; padding: 2px;">M 1.1-4.1</span></li> <li><span style="background-color: #ff7f50; padding: 2px;">K 1.1-4.2</span></li> <li><span style="background-color: #90ee90; padding: 2px;">N 1.1-5.2</span></li> <li><span style="background-color: #ff8c00; padding: 2px;">S 1.1-2.6</span></li> <li><span style="background-color: #cccccc; padding: 2px;">H 1.1-2</span></li> </ul>
P mm	T.P.I.	HM-FP-Z1 26 mm	HM-FP-Z1 26 mm TIALN-T4

**M, MF**

For internal threads

ISO Metric threads  
DIN 13

1	GF603142.9512	•		
1.5	GF603142.9514	•	GF603147.9514	•
2	GF603142.9516	•	GF603147.9516	•
2.5	GF603142.9517	•	GF603147.9517	•
3	GF603142.9518	•	GF603147.9518	•
3.5	GF603142.9519	•	GF603147.9519	•
4	GF603142.9520	•	GF603147.9520	•

**G**

For internal and external threads

Whitworth pipe threads  
DIN EN ISO 228, BS 84

14	GF603142.9548	•	GF603147.9548	•
11	GF603142.9550	•	GF603147.9550	•

Accessories

 **GZ309210** Spare screw M4 x 13; Torx T15

 **GZ309020** Screw driver Torx T15

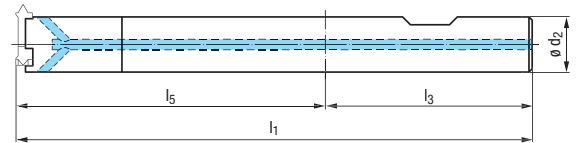
For indexable infeed inserts, "3-tooth" design

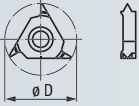
DIN  
6535 HB



Carbide design

Insert Size	l <sub>1</sub>	mm			ø d <sub>2</sub> h6	CIRC-GF Size 02 IKZN
		l <sub>3</sub>	l <sub>5</sub>	l <sub>6</sub>		
02	112	45	67	12	<b>GZ311330</b>	●







**Carbide** **RH + LH**

Coating

Range of Application

**Indexable infeed inserts, "3-tooth" design**

Coating: **TIALN-T4**

**P** 1.1-5.1

**K** 1.1-4.2

**N** 1.1-5, 2.1-6, 3.1-4.2, 5.2

**S** 1.1-3

**P** 1.1-5.1

**M** 1.1-4.1

**K** 1.1-4.2

**N** 1.1-5.2

**S** 1.1-2.6

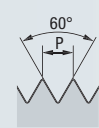
**H** 1.1-2

Insert Size	P mm	ø D
-------------	------	-----

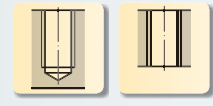
HM-EP-Z3 Size 02	HM-EP-Z3 Size 02 TIALN-T4
---------------------	---------------------------------

M, MF

ISO Metric threads  
DIN 13



For internal threads



Insert Size	P mm	ø D
02	1 - 3.5	17.5
02	3	17.5
02	2.5 (M20)	16

<b>GF613121.9512</b>	●	<b>GF613127.9512</b>	●
<b>GF613121.9518</b>	●	<b>GF613127.9518</b>	●
<b>GF613121.0120</b>	●	<b>GF613127.0120</b>	●

Accessories

-  **GZ319020** Spare screw M4 x 11; Torx T15
-  **GZ319060** Screw driver Torx T15

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF**
- Gigant
- MoSys



Product  
Finder

V<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

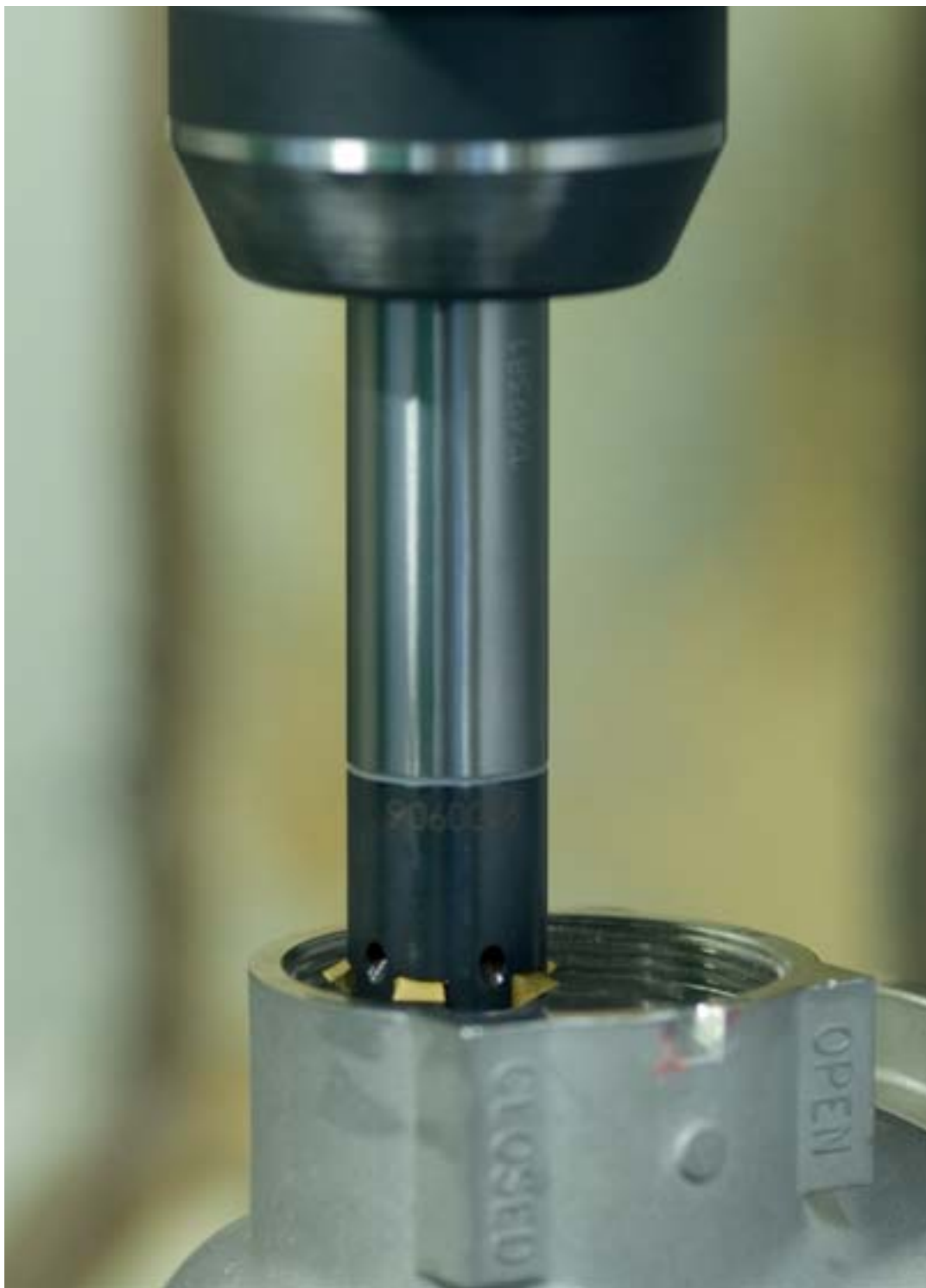
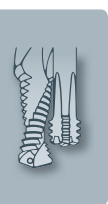
GF(I)-KEG

ZGF(I)

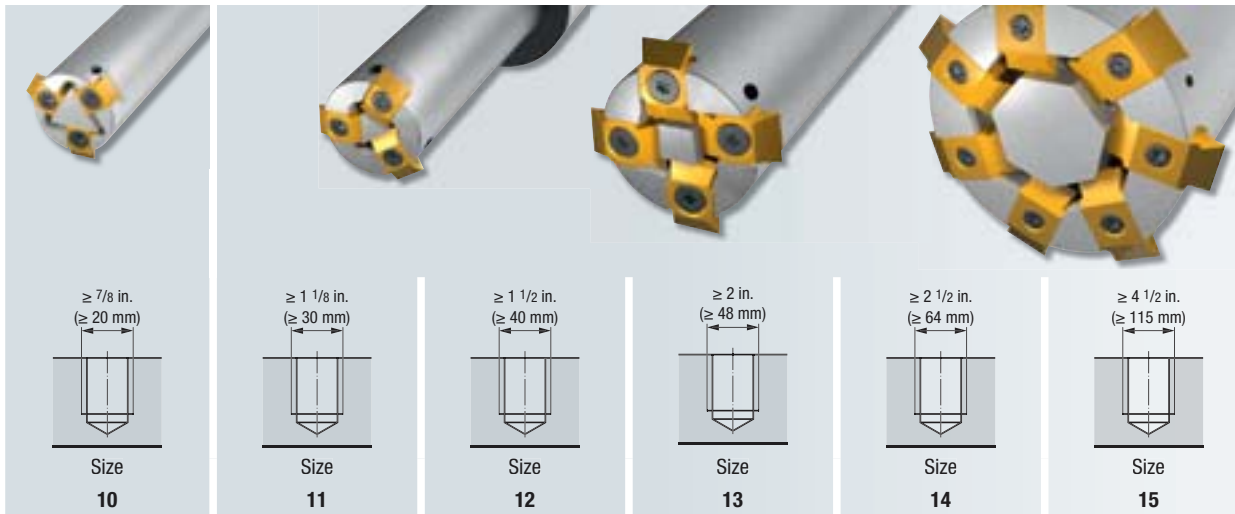
CIRC-GF

Gigant

MoSys

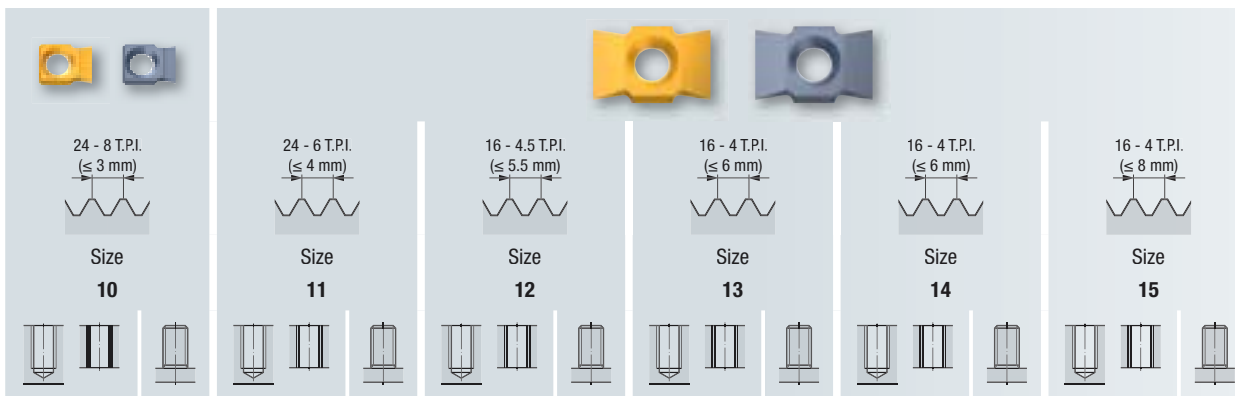






Page

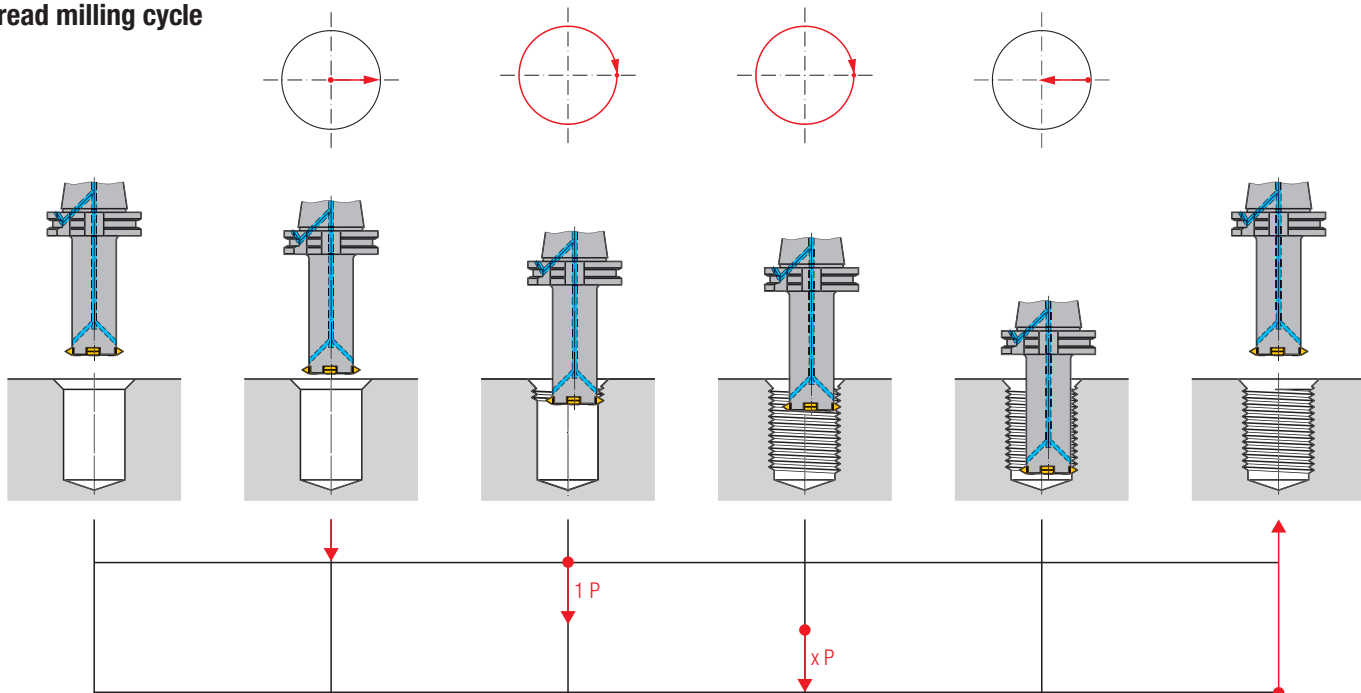
256	258	260	262 - 263	264	266
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Page

257		259		261		263		265		267	<b>UN</b>
257	257	259	259	261	261	263	263	265	265	267	<b>M, MF</b>
257	257	259	259	261	261	263	263	265	265		<b>G BSW, BSF, W</b>
		259		261							<b>NPT</b>

Thread milling cycle



Product Finder

V<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

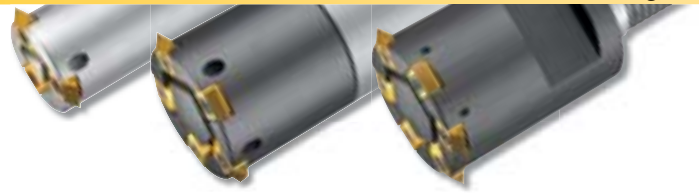
ZGF(I)

CIRC-GF

**Gigant**

MoSys





# 10

For large thread sizes, from thread diameter 7/8 in. (20 mm)

### Gigant-ic

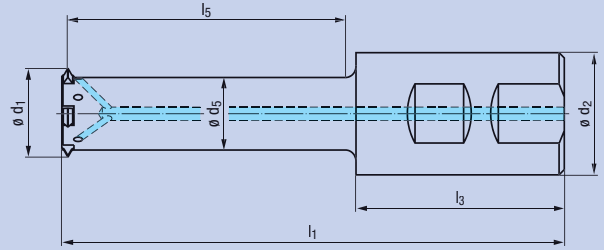
### Gigant "sprinter"



ASME B94.19	inch							Gigant-ic		Gigant sprinter		
	$\emptyset D_{min.}$	$l_1$	$l_3$	$l_5$	$\emptyset d_1$	$\emptyset d_2$	$\emptyset d_5$	Ins.	Size 10-IKZN		Size 10-IKZN	
7/8	3.425	1 25/32	1.575	0.669	1/2	0.470	2		<b>GZ340050</b>	●	<b>GZ340000</b>	●
1	4.567	1 29/32	2.575	0.807	5/8	0.618	3				<b>GZ340200</b>	●
1 1/8	5.610	2 9/32	3.150	0.939	1 1/4	0.748	5					



DIN 1835 B	mm							Gigant-ic		Gigant sprinter		
	$\emptyset D_{min.}$	$l_1$	$l_3$	$l_5$	$\emptyset d_1$	$\emptyset d_2$ h6	$\emptyset d_5$	Ins.	Size 10-IKZN		Size 10-IKZN	
20	87	45	40	17	12	12	2		<b>GZ341000</b>	●		
24	100	48	50	20.5	16	15.9	3		<b>GZ341040</b>	●		
24	115	48	65	20.5	16	15.9	3		<b>GZ341050</b>	●		
30	145	60	80	23.85	32	19	5				<b>GZ341200</b>	●

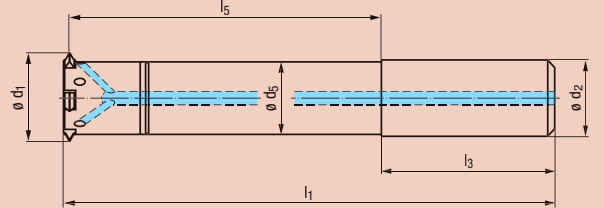


### Gigant "soft run"

### Gigant "soft run sprinter"



DIN 6535 HA	mm							Gigant soft run		Gigant soft run sprinter		
	$\emptyset D_{min.}$	$l_1$	$l_3$	$l_5$	$\emptyset d_1$	$\emptyset d_2$ h6	$\emptyset d_5$	Ins.	Size 10-IKZN		Size 10-IKZN	
20	97	45	50	17	12	12	2		<b>GZ34A010</b>	●		
24	115	48	65	20.5	16	16	3		<b>GZ34A000</b>	●		
30	142	50	90	23.85	20	19	5				<b>GZ34C000</b>	●
36	153	56	95	30	25	25	7				<b>GZ34C010</b>	●
40	178	60	115	32.85	32	27.7	8				<b>GZ34C020</b>	●

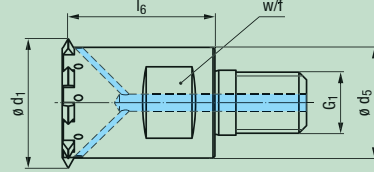


With variable length upon request

### Gigant "modular"



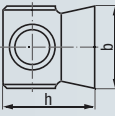


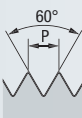
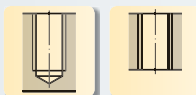



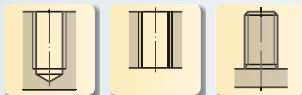
M	mm						Gigant modular	
	$\emptyset D_{min.}$	$l_6$	$\emptyset d_1$	$\emptyset d_5$	$G_1$	w/f	Ins.	Size 10-IKZN
40	38	34.25	29	M16	22	9		<b>GZ351000</b>



Screw-in holders and extensions for Gigant "modular", see page 268

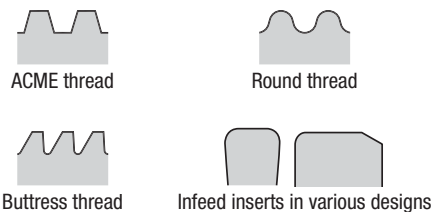
# 10

2-tooth indexable inserts for a pitch range from 24 - 8 T.P.I. (up to 3 mm)

						<b>Carbide</b>		<b>RH + LH</b>											
						Coating		<b>TIN</b>		<b>TIALN-T4</b>									
						Range of Application		<b>P 1.1-5.1</b>		<b>M 1.1-4.1</b>		<b>K 1.1-4.2</b>							
								<b>N 1.1-4.4</b>		<b>S 1.1-3</b>									
<b>T.P.I.</b>						<b>P</b> mm		<b>b</b> mm    inch		<b>h</b> mm    inch		<b>HM-WP-Z2</b> Size 10 <b>TIN</b>		<b>HM-WP-Z2</b> Size 10 <b>TIALN-T4</b>					
<h2>UN, M, MF</h2> <p>Unified threads ANSI B1.1 and ISO Metric threads DIN 13</p> 						For internal threads													
24 - 10						1 - 2.5		5    0.197		7    0.276		<b>GF643005.9512</b>		●		<b>GF643007.9512</b>		●	
16 - 8						1.5 - 3		5    0.197		7    0.276		<b>GF643005.9514</b>		●		<b>GF643007.9514</b>		●	
<h2>M, MF</h2> <p>ISO Metric threads DIN 13</p> 						For external threads													
						1.5		5    0.197		7    0.276				<b>GF641007.9514</b>		●			
						2		5    0.197		7    0.276				<b>GF641007.9516</b>		●			
<h2>G</h2> <p>BSW, BSF, W</p> <p>Whitworth pipe threads DIN EN ISO 228 and Whitworth threads BS 84</p> 						For internal and external threads													
14 (28 - 9)						(1.814)		5    0.197		7    0.276		<b>GF643005.9548</b>		●		<b>GF643007.9548</b>		●	

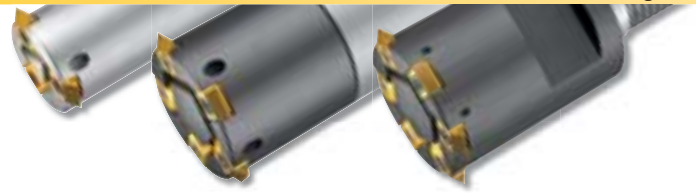
- Product Finder
- Vc
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant**
- MoSys

Other designs upon request, e.g.



Accessories





# 11

For large thread sizes, from thread diameter 1 1/8 in. (30 mm)

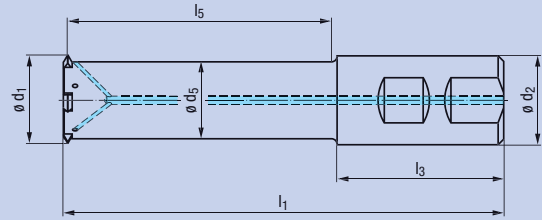
### Gigant-ic

### Gigant "sprinter"

ASME B94.19		3-5 Ins.		6-8 Ins.					
$\varnothing D_{min.}$	$l_1$	$l_3$	$l_5$	$\varnothing d_1$	$\varnothing d_2$	$\varnothing d_5$	Ins.	Gigant-ic Size 11-IKZN	Gigant sprinter Size 11-IKZN
1 1/8	4.744	2 9/32	2.362	0.939	1 1/4	0.760	3	GZ340121	●
1 1/8	5.512	2 9/32	3.150	0.939	1 1/4	0.760	3	GZ340001	●
1 1/8	5.906	2 9/32	3.543	0.939	1 1/4	0.760	3	GZ340101	●
1 1/2	5.945	2 9/32	3.543	1.102	1 1/4	0.906	5	GZ340211	●
1 3/4	4.799	2 9/32	2.398	1.339	1 1/4	1.134	6		GZ340221 ●
2	5.591	2 9/32	3.150	1.585	1 1/4	1.378	8		GZ340231 ●

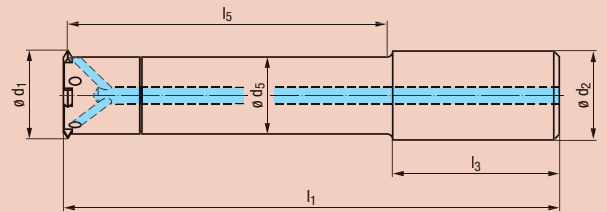
DIN 1835 B		3 Inserts		5-8 Ins.					
$\varnothing D_{min.}$	$l_1$	$l_3$	$l_5$	$\varnothing d_1$	$\varnothing d_2$ h6	$\varnothing d_5$	Ins.	Gigant-ic Size 11-IKZN	Gigant sprinter Size 11-IKZN
30	122	60	60	23.85	32	19.3	3	GZ341121	●
30	138	56	80	23.85	25	19.3	3	GZ341021	●
30	142	60	80	23.85	32	19.3	3	GZ341001	●
30	152	60	90	23.85	32	19.3	3	GZ341101	●
34	153	60	90	28	32	23	5		GZ341211 ●
36	157	60	95	29.5	32	24.6	3	GZ341131	●
40	159	60	95	32.85	32	27.7	5		GZ341201 ●
40	122	60	90	34	32	29	6		GZ341221 ●
48	142	60	90	40.25	32	35	8		GZ341231 ●



### Gigant "soft run"

### Gigant "soft run sprinter"

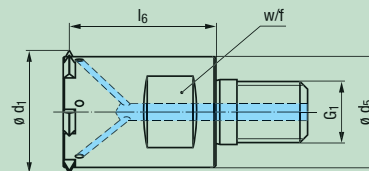
DIN 6535 HA		3 Inserts		5 Inserts					
$\varnothing D_{min.}$	$l_1$	$l_3$	$l_5$	$\varnothing d_1$	$\varnothing d_2$ h6	$\varnothing d_5$	Ins.	Gigant soft run Size 11-IKZN	Gigant soft run sprinter Size 11-IKZN
30	142	50	90	23.85	20	19.3	3	GZ34A001	●
40	179	60	115	32.85	32	27.7	5		GZ34C001 ●



With variable length upon request

### Gigant "modular"

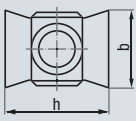


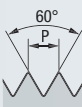
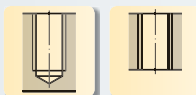
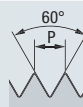

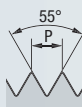
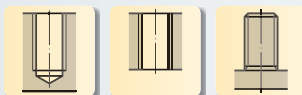
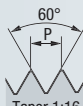
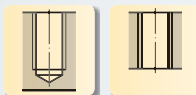
M		6 Inserts					
$\varnothing D_{min.}$	$l_6$	$\varnothing d_1$	$\varnothing d_5$	$G_1$	w/f	Ins.	Gigant modular Size 11-IKZN
42	38	34.25	29	M16	22	6	GZ351001 ●



Screw-in holders and extensions for Gigant "modular", see page 268

# 11

4-tooth indexable inserts for a pitch range from 24 - 6 T.P.I. (up to 4 mm)

						<b>Carbide</b> <b>RH + LH</b>					
						Coating: <b>TIN</b> <b>TIALN-T4</b>					
						Range of Application: <b>P 1.1-5.1</b> <b>M 1.1-4.1</b> <b>K 1.1-4.2</b> <b>N 1.1-4.4</b> <b>S 1.1-3</b>					
<b>T.P.I.</b>	<b>P</b> mm	<b>b</b> mm	<b>b</b> inch	<b>h</b> mm	<b>h</b> inch	<b>HM-WP-Z4</b> Size 11 <b>TIN</b>		<b>HM-WP-Z4</b> Size 11 <b>TIALN-T4</b>			
<h2>UN, M, MF</h2> <p>Unified threads ANSI B1.1 and ISO Metric threads DIN 13</p>  <p>For internal threads</p> 											
24 - 10	1 - 2.5	6.35	0.250	9.52	0.375	<b>GF643105.9512</b>	●	<b>GF643107.9512</b>	●		
16 - 10	1.5 - 2.5	6.35	0.250	9.52	0.375	<b>GF643105.9514</b>	●	<b>GF643107.9514</b>	●		
10 - 6	2.5 - 4	6.35	0.250	9.52	0.375	<b>GF643105.9517</b>	●	<b>GF643107.9517</b>	●		
<h2>M, MF</h2> <p>ISO Metric threads DIN 13</p>  <p>For external threads</p> 											
	2.5	6.35	0.250	9.52	0.375			<b>GF641107.9517</b>	●		
	3	6.35	0.250	9.52	0.375			<b>GF641107.9518</b>	●		
<h2>G</h2> <p>BSW, BSF, W</p> <p>Whitworth pipe threads DIN EN ISO 228 and Whitworth threads BS 84</p>  <p>For internal and external threads</p> 											
11 (28 - 9)	(2.309)	6.35	0.250	9.52	0.375	<b>GF643105.9550</b>	●	<b>GF643107.9550</b>	●		
<h2>NPT</h2> <p>American tapered pipe thread, ANSI/ASME B1.20.1 for threads with dryseal material, taper 1:16</p>  <p>For internal threads</p> 											
11 1/2	(2.209)	6.35	0.250	9.52	0.375			<b>GF643107.9679</b>	●		

Other designs upon request, e.g.



ACME thread



Round thread



Buttress thread



Infed inserts in various designs

Accessories

-  **GZ349011** Spare screw M2.5 x 8.5; Torx T7
-  **GZ349021** Screw driver Torx T7
-  **GZ349041** Torque screw driver Torx T7

Product Finder
Vc
UNC
UNF
UN
M
MF
NPSF
G
Rp (BSPP)
W
BSW, BSF
NPT
NPTF
Rc (BSPT)
STI
SELF-LOCK
Accessories
Tech. Info
BGF
ZBGF
GSF (Aero)
GSF-Z
GF(I), GF-Z
GF-Vario-Z
GF-H
GF(I)-KEG
ZGF(I)
CIRC-GF
<b>Gigant</b>
MoSys





# 12

For large thread sizes, from thread diameter 1 1/2 in. (40 mm)

### Gigant-ic

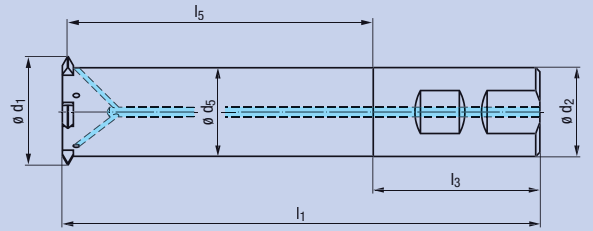
### Gigant "sprinter"

<b>ASME B94.19</b>		<b>3 Inserts</b>	<b>4 Inserts</b>
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$\emptyset D_{min}$	$l_1$	$l_3$	inch		$\emptyset d_1$	$\emptyset d_2$	$\emptyset d_5$	Ins.	Gigant-ic Size 12-IKZN	Gigant sprinter Size 12-IKZN	
1 1/2	6.102	2 9/32	3.740	1.293	1 1/4	0.972	3		<b>GZ340012</b>	●	
1 1/2	6.890	2 9/32	4.528	1.293	1 1/4	0.972	3		<b>GZ340112</b>	●	
BSW, BSF	1 3/4	7.555	2 9/32	5.118	1.417	1 1/4	1.094	4		<b>GZ340212</b>	●

<b>DIN 1835 B</b>		<b>3 Inserts</b>	<b>5 Inserts</b>
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$\emptyset D_{min}$	$l_1$	$l_3$	mm		$\emptyset d_1$	$\emptyset d_2$ h6	$\emptyset d_5$	Ins.	Gigant-ic Size 12-IKZN	Gigant sprinter Size 12-IKZN	
40	153	56	95	32.85	25	24.7	3		<b>GZ341032</b>	●	
40	157	60	95	32.85	32	24.7	3		<b>GZ341012</b>	●	
40	177	60	115	32.85	32	24.7	3		<b>GZ341112</b>	●	
48	172	60	110	40.25	32	31.9	5			<b>GZ341202</b>	●

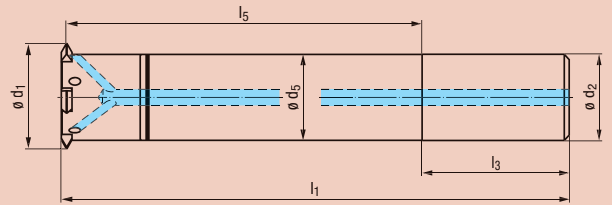


### Gigant "soft run"

### Gigant "soft run sprinter"

<b>DIN 6535 HA</b>		<b>3 Inserts</b>	<b>5 Inserts</b>
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$\emptyset D_{min}$	$l_1$	$l_3$	mm		$\emptyset d_1$	$\emptyset d_2$ h6	$\emptyset d_5$	Ins.	Gigant soft run Size 12-IKZN	Gigant soft run sprinter Size 12-IKZN	
40	173	56	115	32.85	25	24.7	3		<b>GZ34A002</b>	●	
48	207	60	145	40.25	32	31.9	5			<b>GZ34C002</b>	●

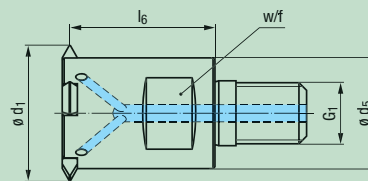


With variable length upon request

### Gigant "modular"

<b>M</b>		<b>4 Inserts</b>
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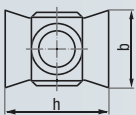







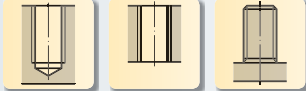

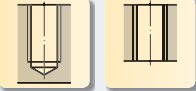
$\emptyset D_{min}$	$l_6$	mm		$G_1$	w/f	Ins.	Gigant modular Size 12-IKZN
46	38	37.5	29	M16	22	4	<b>GZ351002</b>



Screw-in holders and extensions for Gigant "modular", see page 268

# 12

4-tooth indexable inserts for a pitch range from 16 - 4.5 T.P.I. (up to 5.5 mm)

						Carbide <b>RH + LH</b>			
						Coating		TIN	TIALN-T4
						Range of Application		P 1.1-5.1   M 1.1-4.1   K 1.1-4.2 N 1.1-4.4   S 1.1-3	
T.P.I.	P mm	b mm	inch	h mm	inch	HM-WP-Z4 Size 12 TIN		HM-WP-Z4 Size 12 TIALN-T4	
<h2>UN, M, MF</h2> <p>Unified threads ANSI B1.1 and ISO Metric threads DIN 13</p>  <p>For internal threads</p> 						GF643205.9514 ● GF643205.9517 ●		GF643207.9514 ● GF643207.9517 ●	
16 - 10	1.5 - 2.5	8.5	0.335	13.5	0.531				
10 - 4.5	2.5 - 5.5	8.5	0.335	13.5	0.531				
<h2>M, MF</h2> <p>ISO Metric threads DIN 13</p>  <p>For external threads</p> 								GF641207.9519 ● GF641207.9520 ●	
	3.5	8.5	0.335	13.5	0.531				
	4	8.5	0.335	13.5	0.531				
<h2>G</h2> <p>BSW, BSF, W</p> <p>Whitworth pipe threads DIN EN ISO 228 and Whitworth threads BS 84</p>  <p>For internal and external threads</p> 						GF643205.9550 ●		GF643207.9550 ●	
11 (28 - 5)	(2.309)	8.5	0.335	13.5	0.531				
<h2>NPT</h2> <p>American tapered pipe thread, ANSI/ASME B1.20.1 for threads with dryseal material, taper 1:16</p>  <p>For internal threads</p> 								GF643207.9680 ●	
8	(3.175)	8.5	0.335	13.5	0.531				

Other designs upon request, e.g.



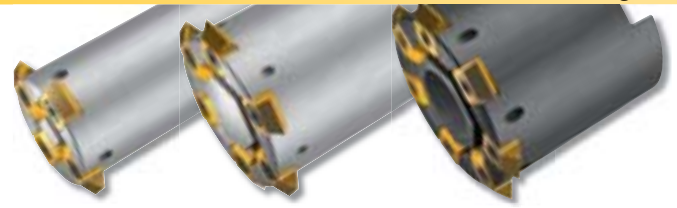
Accessories

- 
**GZ349012** Spare screw M3 x 11; Torx T9
- 
**GZ349022** Screw driver Torx T9
- 
**GZ349042** Torque screw driver Torx T9

Product Finder

- Vc
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant**
- MoSys





# 13

For large thread sizes, from thread diameter 2 in. (48 mm)

### Gigant-ic      Gigant "sprinter"

<b>ASME B94.19</b>		<b>4 Inserts</b>	<b>5 Inserts</b>
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								Gigant-ic	Gigant sprinter
								Size 13-IKZN	Size 13-IKZN
$\varnothing D_{min.}$	$l_1$	$l_3$	$l_5$	$\varnothing d_1$	$\varnothing d_2$	$\varnothing d_5$	Ins.		
2	6.732	2 9/32	4.331	1.585	1 1/4	1.193	4	<b>GZ340153</b>	●
2	8.110	2 9/32	5.709	1.585	1 1/4	1.193	4	<b>GZ340143</b>	●
2 1/4	9.559	2 11/16	6.693	1.890	1 1/2	1.496	5		<b>GZ340203</b> ●

<b>DIN 1835 B</b>		<b>4 Inserts</b>
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								Gigant-ic	
								Size 13-IKZN	
$\varnothing D_{min.}$	$l_1$	$l_3$	$l_5$	$\varnothing d_1$	$\varnothing d_2$ h6	$\varnothing d_5$	Ins.		
48	173	60	110	40.25	32	30.3	4	<b>GZ341153</b>	●
48	210	60	147	40.25	32	30.3	4	<b>GZ341143</b>	●

<b>DIN 69871 AD/B</b>		<b>4 Inserts</b>	<b>6 Inserts</b>
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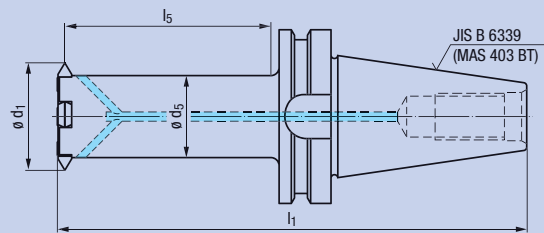
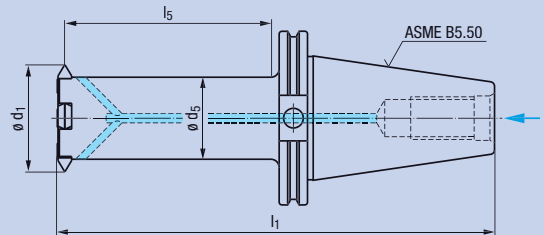
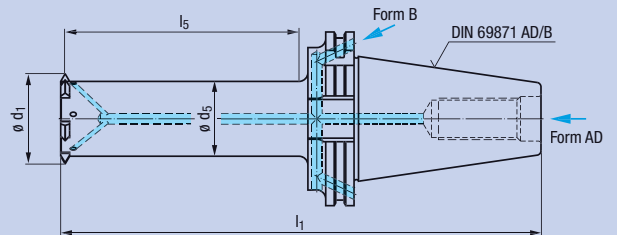
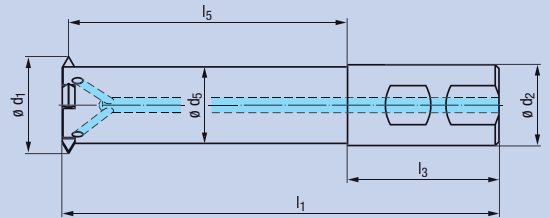
								Gigant-ic	Gigant sprinter
								Size 13-IKZN	Size 13-IKZN
$\varnothing D_{min.}$	$l_1$	$l_5$	$\varnothing d_1$	Taper Size	$\varnothing d_5$	Ins.			
48	212	110	40.25	SK 40	30.3	4	<b>GZ343003</b>	●	
48	245	110	40.25	SK 50	30.3	4	<b>GZ344003</b>	●	
48	247	145	40.25	SK 40	30.3	4	<b>GZ343103</b>	●	
48	280	145	40.25	SK 50	30.3	4	<b>GZ344103</b>	●	
64	333	195	52.55	SK 50	43.7	6			<b>GZ344203</b> ●

<b>ASME B5.50</b>		<b>4 Inserts</b>
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								Gigant-ic	
								Size 13-IKZN	
$\varnothing D_{min.}$	$l_1$	$l_5$	$\varnothing d_1$	Taper Size	$\varnothing d_5$	Ins.			
2	9.620	4.331	1.585	CAT 50	1.193	4	<b>GZ346013</b>	●	
2	11.000	5.709	1.585	CAT 50	1.193	4	<b>GZ346003</b>	●	

<b>JIS B 6339</b>		<b>4 Inserts</b>
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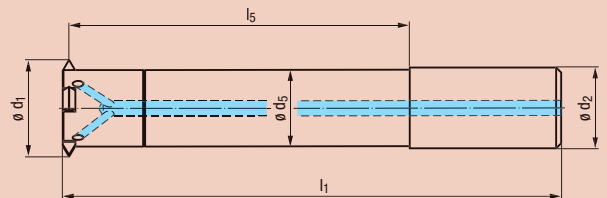
								Gigant-ic	
								Size 13-IKZN	
$\varnothing D_{min.}$	$l_1$	$l_5$	$\varnothing d_1$	Taper Size	$\varnothing d_5$	Ins.			
2	11.772	5.709	1.585	BT 50	1.193	4	<b>GZ348103</b>	●	



### Gigant "soft run"

<b>DIN 6535 HA</b>		<b>4 Inserts</b>
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								Gigant soft run	
								Size 13-IKZN	
$\varnothing D_{min.}$	$l_1$	$l_3$	$l_5$	$\varnothing d_1$	$\varnothing d_2$ h6	$\varnothing d_5$	Ins.		
48	207	60	145	40.25	32	30.3	4	<b>GZ34A003</b>	●

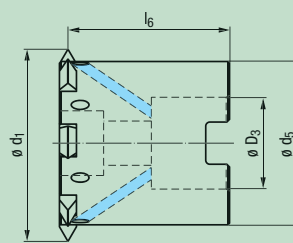
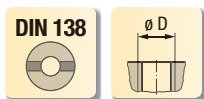


With variable length upon request



- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant**
- MoSys

**Gigant "modular"**



∅ D <sub>min.</sub>	l <sub>6</sub>	mm ∅ d <sub>1</sub>	∅ d <sub>5</sub>	∅ D <sub>3</sub>	Ins.	Gigant modular Size 13-IKZN
66	47.5	57.5	48	27	7	<b>GZ352003</b> ●

Shell-type holders for Gigant "modular", see page 269

# 13

4-tooth indexable inserts for a pitch range from 16 - 4 T.P.I. (up to 6 mm)

	<b>Carbide</b> <b>RH + LH</b>			Coating	TIN	TIALN-T4	
				Range of Application	<span style="background-color: #0070C0; color: white; padding: 2px;">P 1.1-5.1</span> <span style="background-color: #FFD700; color: black; padding: 2px;">M 1.1-4.1</span> <span style="background-color: #DC143C; color: white; padding: 2px;">K 1.1-4.2</span> <span style="background-color: #90EE90; color: black; padding: 2px;">N 1.1-4.4</span> <span style="background-color: #FF8C00; color: black; padding: 2px;">S 1.1-3</span>		
T.P.I.	P mm	b mm	inch	h mm	inch	HM-WP-Z4 Size 13 TIN	HM-WP-Z4 Size 13 TIALN-T4

<h2>UN, M, MF</h2> <p>Unified threads ANSI B1.1 and ISO Metric threads DIN 13</p> <p>For internal threads</p>							
16 - 9	1.5 - 3	9.5	0.374	15.5	0.610	<b>GF643305.9514</b> ●	<b>GF643307.9514</b> ●
9 - 4	3 - 6	9.5	0.374	15.5	0.610	<b>GF643305.9518</b> ●	<b>GF643307.9518</b> ●

<h2>M, MF</h2> <p>ISO Metric threads DIN 13</p> <p>For external threads</p>							
	4.5	9.5	0.374	15.5	0.610		<b>GF641307.9521</b> ●
	5	9.5	0.374	15.5	0.610		<b>GF641307.9522</b> ●

<h2>G</h2> <p>BSW, BSF, W</p> <p>Whitworth pipe threads DIN EN ISO 228 and Whitworth threads BS 84</p> <p>For internal and external threads</p>							
11 (12 - 4.5)	(2.309)	9.5	0.374	15.5	0.610	<b>GF643305.9550</b> ●	<b>GF643307.9550</b> ●

Other designs upon request, e.g.

Accessories



ACME thread



Round thread



Buttress thread



Infed inserts in various designs



**GZ349013** Spare screw M4 x 13; Torx T15



**GZ349023** Screw driver Torx T15



**GZ349043** Torque screw driver Torx T15



# 14

For large thread sizes, from thread diameter 2 1/2 in. (64 mm)

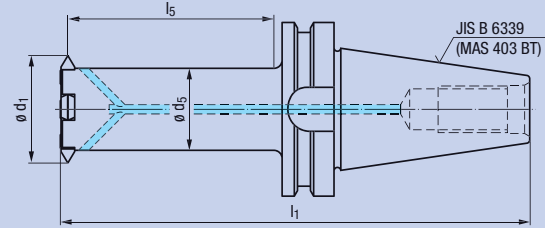
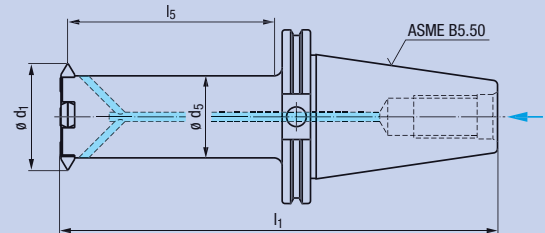
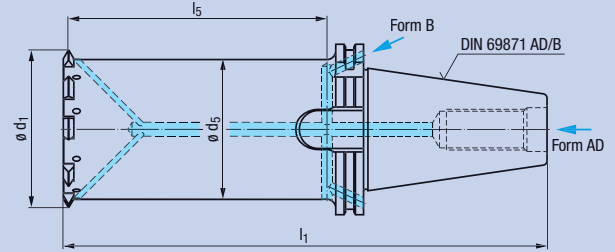
### Gigant-ic

### Gigant "sprinter"

DIN 69871		4-7 Ins.		10 Inserts				
$\theta$ D <sub>min.</sub>	l <sub>1</sub>	l <sub>5</sub>	$\theta$ d <sub>1</sub>	Taper Size	$\theta$ d <sub>5</sub>	Ins.	Gigant-ic Size 14-IKZN	Gigant sprinter Size 14-IKZN
64	253	150	52.55	SK 40	41.3	4	<b>GZ343014</b>	●
64	286	150	52.55	SK 50	41.3	4	<b>GZ344014</b>	●
64	298	195	52.55	SK 40	41.3	4	<b>GZ343114</b>	●
64	331	195	52.55	SK 50	41.3	4	<b>GZ344114</b>	●
80	308	170	66.55	SK 50	55.3	7	<b>GZ344024</b>	●
80	398	260	66.55	SK 50	55.3	7	<b>GZ344124</b>	●
115	489	360	92	SK 50	80	10		<b>GZ344204</b> ●

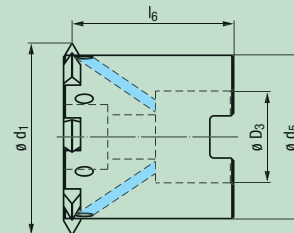
ASME B5.50		4 Inserts					
$\theta$ D <sub>min.</sub>	l <sub>1</sub>	l <sub>5</sub>	$\theta$ d <sub>1</sub>	Taper Size	$\theta$ d <sub>5</sub>	Ins.	Gigant-ic Size 14-IKZN
2 1/2	13.000	7.677	2.069	CAT 50	1.626	4	<b>GZ346024</b> ●

JIS B 6339		4 Inserts					
$\theta$ D <sub>min.</sub>	l <sub>1</sub>	l <sub>5</sub>	$\theta$ d <sub>1</sub>	Taper Size	$\theta$ d <sub>5</sub>	Ins.	Gigant-ic Size 14-IKZN
2 1/2	13.780	7.677	2.069	BT 50	1.626	4	<b>GZ348114</b> ●



### Gigant "modular"

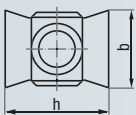


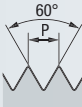
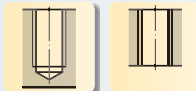



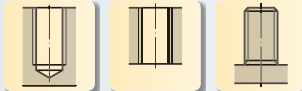
DIN 138		7 Inserts				
$\theta$ D <sub>min.</sub>	l <sub>6</sub>	$\theta$ d <sub>1</sub>	$\theta$ d <sub>5</sub>	$\theta$ D <sub>3</sub>	Ins.	Gigant modular Size 14-IKZN
80	47	71.5	60	27	7	<b>GZ352004</b> ●



Shell-type holders for Gigant "modular", see page 269

# 14

4-tooth indexable inserts for a pitch range from 16 - 4 T.P.I. (up to 6 mm)

						<b>Carbide</b> <b>RH + LH</b>					
						Coating: <b>TIN</b> <b>TIALN-T4</b>					
						Range of Application: <b>P 1.1-5.1</b> <b>M 1.1-4.1</b> <b>K 1.1-4.2</b> <b>N 1.1-4.4</b> <b>S 1.1-3</b>					
<b>T.P.I.</b>	<b>P</b> mm	<b>b</b> mm	<b>inch</b>	<b>h</b> mm	<b>inch</b>	<b>HM-WP-Z4</b> Size 14 <b>TIN</b>		<b>HM-WP-Z4</b> Size 14 <b>TIALN-T4</b>			
<h2>UN, M, MF</h2> <p>Unified threads ANSI B1.1 and ISO Metric threads DIN 13</p>  <p>For internal threads</p> 											
16 - 9	1.5 - 3	12.5	0.492	19	0.748	<b>GF643405.9514</b> ●		<b>GF643407.9514</b> ●			
9 - 4	3 - 6	12.5	0.492	19	0.748	<b>GF643405.9518</b> ●		<b>GF643407.9518</b> ●			
<h2>M, MF</h2> <p>ISO Metric threads DIN 13</p>  <p>For external threads</p> 											
	5.5	12.5	0.492	19	0.748			<b>GF641407.9709</b> ●			
	6	12.5	0.492	19	0.748			<b>GF641407.9523</b> ●			
<h2>G</h2> <p>BSW, BSF, W</p> <p>Whitworth pipe threads DIN EN ISO 228 and Whitworth threads BS 84</p>  <p>For internal and external threads</p> 											
11 (12 - 3.5)	(2.309)	12.5	0.492	19	0.748	<b>GF643405.9550</b> ●		<b>GF643407.9550</b> ●			

- Product Finder
- Vc
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant**
- MoSys



Other designs upon request, e.g.



Accessories

- 
**GZ349014** Spare screw M5 x 15; Torx T20
- 
**GZ349024** Screw driver Torx T20
- 
**GZ349044** Torque screw driver Torx T20

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant**
- MoSys

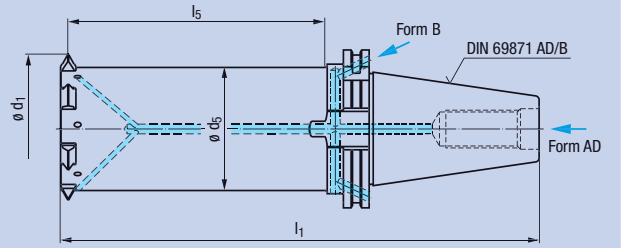
# 15

For large thread sizes, from thread diameter 4 1/2 in. (115 mm)



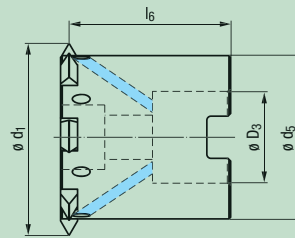
## Gigant-ic

<b>Ø D<sub>min.</sub></b>	<b>l<sub>1</sub></b>	<b>l<sub>5</sub></b>	<b>mm</b>	<b>Ø d<sub>1</sub></b>	<b>Taper Size</b>	<b>Ø d<sub>5</sub></b>	<b>Ins.</b>
115	341	204	92	SK 50	76	7	<b>GZ344035</b> ●
115	497	360	92	SK 50	76	7	<b>GZ344045</b> ●



## Gigant "modular"

<b>Ø D<sub>min.</sub></b>	<b>l<sub>6</sub></b>	<b>mm</b>	<b>Ø d<sub>1</sub></b>	<b>Ø d<sub>5</sub></b>	<b>Ø D<sub>3</sub></b>	<b>Ins.</b>
115	55	94	78	32	7	<b>GZ352005</b> ●

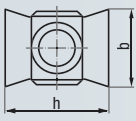


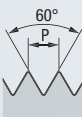
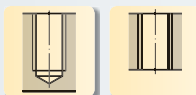


Shell-type holders for Gigant "modular", see page 269



# 15

4-tooth indexable inserts for a pitch range from 16 - 4 T.P.I. (up to 8 mm)

						<b>Carbide</b> <b>RH + LH</b>																							
						Coating		TIN		TIALN-T4																			
						Range of Application		P 1.1-5.1   M 1.1-4.1   K 1.1-4.2		N 1.1-4.4   S 1.1-3																			
						HM-WP-Z4 Size 15 TIN		HM-WP-Z4 Size 15 TIALN-T4																					
<b>UN, M, MF</b> Unified threads ANSI B1.1 and ISO Metric threads DIN 13								For internal threads																					
<table border="1"> <thead> <tr> <th>T.P.I.</th> <th>P mm</th> <th>b mm</th> <th>b inch</th> <th>h mm</th> <th>h inch</th> </tr> </thead> <tbody> <tr> <td>16 - 4</td> <td>1.5 - 6</td> <td>14.3</td> <td>0.563</td> <td>28.58</td> <td>1.125</td> </tr> <tr> <td>4</td> <td>6 - 8</td> <td>14.3</td> <td>0.563</td> <td>28.58</td> <td>1.125</td> </tr> </tbody> </table>						T.P.I.	P mm	b mm	b inch	h mm	h inch	16 - 4	1.5 - 6	14.3	0.563	28.58	1.125	4	6 - 8	14.3	0.563	28.58	1.125	GF643505.9514   ● GF643505.9523   ●		GF643507.9514   ● GF643507.9523   ●			
T.P.I.	P mm	b mm	b inch	h mm	h inch																								
16 - 4	1.5 - 6	14.3	0.563	28.58	1.125																								
4	6 - 8	14.3	0.563	28.58	1.125																								

- Product Finder
- Vc
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant**
- MoSys

Other designs upon request, e.g.



Accessories

- 
**GZ349015** Spare screw M5 x 18; Torx T20
- 
**GZ349025** Screw driver Torx T20
- 
**GZ349045** Torque screw driver Torx T20



Product Finder

$v_c$   
**10-12**

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

ZGF(I)

CIRC-GF

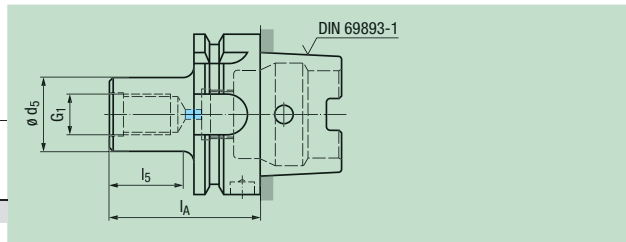
**Gigant**

MoSys



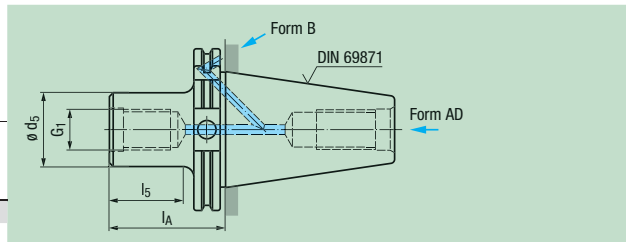
### Screw-in holders for Gigant "modular"

**HSK-A**



Size	G <sub>1</sub>	$\varnothing d_5$ mm	l <sub>5</sub>	l <sub>A</sub>	Taper Size	
10-12	M16	29	29	59	HSK-A63	<b>GZ5391A4.11605</b> ●

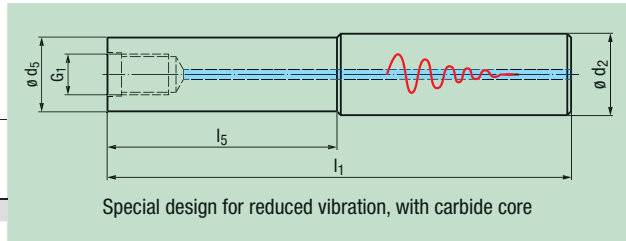
**SK (ISO)**



Size	G <sub>1</sub>	$\varnothing d_5$ mm	l <sub>5</sub>	l <sub>A</sub>	Taper Size	
10-12	M16	29	11	36	SK 40	<b>GZ5243A4.11603</b> ●
10-12	M16	29	11	36	SK 50	<b>GZ5263A4.11603</b> ●

### Screw-in HSS extensions for Gigant "modular"

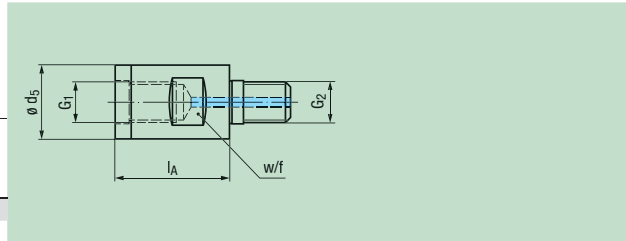
**32 mm**



Size	G <sub>1</sub>	$\varnothing d_5$ mm	l <sub>5</sub>	l <sub>1</sub>	$\varnothing d_2$ h6	
10-12	M16	29.4	108	200	32	<b>GZ5521A4.32010</b> ●

### Screw-in intermediate adapters for Gigant "modular"

**M16**



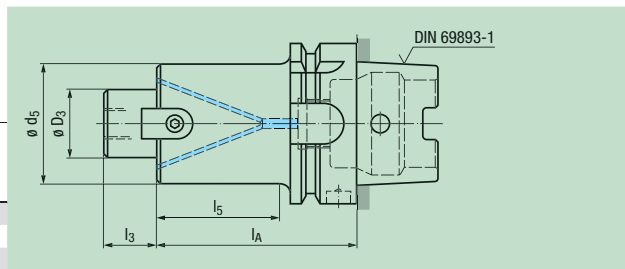
Size	G <sub>1</sub>	$\varnothing d_5$ mm	l <sub>A</sub>	w/f	G <sub>2</sub>	
10-12	M16	29	40	22	M16	<b>GZ56E1A4.11604</b> ●
10-12	M16	29	90	22	M16	<b>GZ56E1A4.11609</b> ●

# 13-15

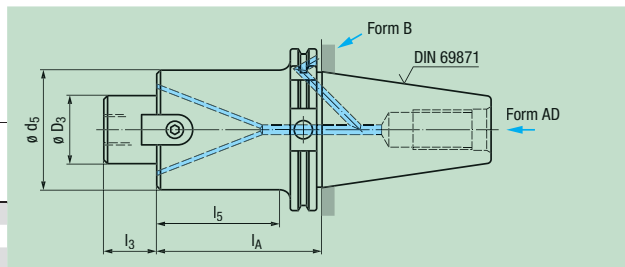


## Shell-type holders for Gigant "modular"

HSK-A		DIN 69893-1		DIN 138			
Size	$\varnothing D_3$	$\varnothing d_5$	mm $l_5$	$l_3$	$l_A$	Taper Size	
13	27	48	131	21	160	HSK-A63	<b>GZ5391B4.27016</b> ●
14	27	60	131	21	160	HSK-A63	<b>GZ5391B5.27016</b> ●
15	32	78	171	24	200	HSK-A63	<b>GZ5391B4.32020</b> ●



SK (ISO)		DIN 69871		DIN 138			
Size	$\varnothing D_3$	$\varnothing d_5$	mm $l_5$	$l_3$	$l_A$	Taper Size	
13	27	48	132	21	160	SK 50	<b>GZ5263B4.27016</b> ●
14	27	60	132	21	160	SK 50	<b>GZ5263B5.27016</b> ●
15	32	78	174	24	200	SK 50	<b>GZ5263B4.32020</b> ●



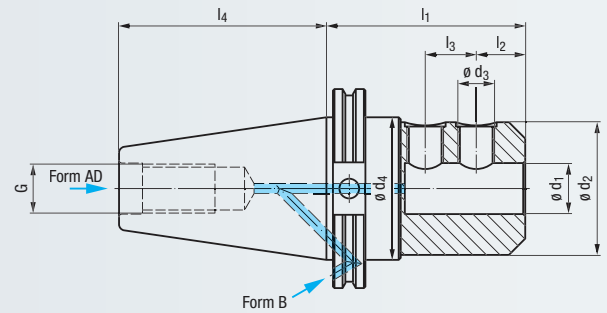
The cutter clamping screw is included in the delivery

- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant**
- MoSys

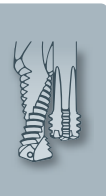


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

## CAT Shank ASME B5.50



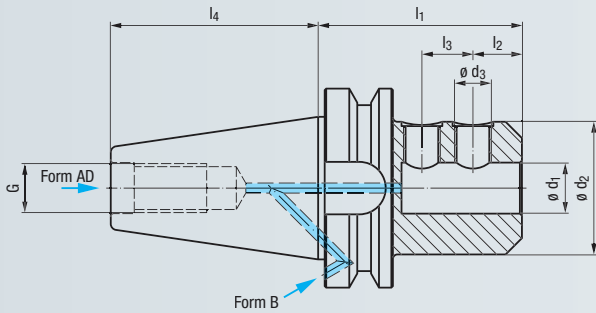
	ø d <sub>1</sub>		Taper Size	ø d <sub>2</sub>	ø d <sub>3</sub>	ø d <sub>4</sub>	inch				G		
	mm	inch					l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>			
6	0.236	CAT 40	0.984	M6	1.750	2.392	0.709	—	2.687	5/8 - 11	GZ514311.06006	●	
		CAT 50	0.984	M6	2.750	2.417	0.709	—	4.000	1 - 8	GZ516311.06006	●	
8	0.315	CAT 40	1.102	M8	1.750	2.392	0.709	—	2.687	5/8 - 11	GZ514311.08006	●	
		CAT 50	1.102	M8	2.750	2.417	0.709	—	4.000	1 - 8	GZ516311.08006	●	
10	0.394	CAT 40	1.378	M10	1.750	2.785	0.787	—	2.687	5/8 - 11	GZ514311.10007	●	
		CAT 50	1.378	M10	2.750	2.811	0.787	—	4.000	1 - 8	GZ516311.10007	●	
12	0.472	CAT 40	1.654	M12	1.750	2.785	0.886	—	2.687	5/8 - 11	GZ514311.12007	●	
		CAT 50	1.654	M12	2.750	2.811	0.886	—	4.000	1 - 8	GZ516311.12007	●	
14	0.551	CAT 40	1.732	M12	1.750	2.785	0.886	—	2.687	5/8 - 11	GZ514311.14007	●	
		CAT 50	1.732	M12	2.750	2.811	0.886	—	4.000	1 - 8	GZ516311.14007	●	
16	0.630	CAT 40	1.890	M14	1.750	2.982	0.945	—	2.687	5/8 - 11	GZ514311.16007	●	
		CAT 50	1.890	M14	2.750	3.008	0.945	—	4.000	1 - 8	GZ516311.16007	●	
18	0.709	CAT 40	1.969	M14	1.750	2.982	0.945	—	2.687	5/8 - 11	GZ514311.18007	●	
		CAT 50	1.969	M14	2.750	3.008	0.945	—	4.000	1 - 8	GZ516311.18007	●	
20	0.787	CAT 40	2.047	M16	1.750	2.982	0.984	—	2.687	5/8 - 11	GZ514311.20007	●	
		CAT 50	2.047	M16	2.750	3.008	0.984	—	4.000	1 - 8	GZ516311.20007	●	
25	0.984	CAT 40	2.559	M18 x 2	1.750	3.809	0.945	0.984	2.687	5/8 - 11	GZ514311.25009	●	
		CAT 50	2.559	M18 x 2	2.750	3.835	0.945	0.984	4.000	1 - 8	GZ516311.25009	●	
32	1.260	CAT 40	2.835	M20 x 2	1.750	4.163	0.945	1.102	2.687	5/8 - 11	GZ514311.32010	●	
		CAT 50	2.835	M20 x 2	2.750	4.189	0.945	1.102	4.000	1 - 8	GZ516311.32010	●	







**BT Shank**  
JIS B 6339 (MAS 403 BT)



mm	ø d <sub>1</sub>		Taper Size	ø d <sub>2</sub>	ø d <sub>3</sub>	inch				G		
	mm	inch				l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>			
6	0.236		BT 40	0.984	M6	2.307	0.709	—	2.575	M16	GZ544311.06005	●
			BT 50	0.984	M6	3.236	0.709	—	4.008	M24	GZ546311.06008	●
8	0.315		BT 40	1.102	M8	2.307	0.709	—	2.575	M16	GZ544311.08005	●
			BT 50	1.102	M8	3.236	0.709	—	4.008	M24	GZ546311.08008	●
10	0.394		BT 40	1.378	M10	2.307	0.787	—	2.575	M16	GZ544311.10005	●
			BT 50	1.378	M10	3.236	0.787	—	4.008	M24	GZ546311.10008	●
12	0.472		BT 40	1.654	M12	2.307	0.886	—	2.575	M16	GZ544311.12005	●
			BT 50	1.654	M12	3.236	0.886	—	4.008	M24	GZ546311.12008	●
14	0.551		BT 40	1.732	M12	2.307	0.886	—	2.575	M16	GZ544311.14005	●
			BT 50	1.732	M12	3.236	0.886	—	4.008	M24	GZ546311.14008	●
16	0.630		BT 40	1.890	M14	2.819	0.945	—	2.575	M16	GZ544311.16007	●
			BT 50	1.890	M14	3.236	0.945	—	4.008	M24	GZ546311.16008	●
18	0.709		BT 40	1.969	M14	2.819	0.945	—	2.575	M16	GZ544311.18007	●
			BT 50	1.969	M14	3.236	0.945	—	4.008	M24	GZ546311.18008	●
20	0.787		BT 40	2.047	M16	2.819	0.984	—	2.575	M16	GZ544311.20007	●
			BT 50	2.047	M16	3.236	0.984	—	4.008	M24	GZ546311.20008	●
25	0.984		BT 40	2.559	M18 x 2	3.488	0.945	0.984	2.575	M16	GZ544311.25008	●
			BT 50	2.559	M18 x 2	3.906	0.945	0.984	4.008	M24	GZ546311.25009	●
32	1.260		BT 40	2.835	M20 x 2	3.724	0.945	1.102	2.575	M16	GZ544311.32009	●
			BT 50	2.835	M20 x 2	4.693	0.945	1.102	4.008	M24	GZ546311.32011	●

Product Finder

v<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

ZGF(I)

CIRC-GF

Gigant

MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys**

### “MoSys” makes a large number of counterbore and stepped bore operations possible!

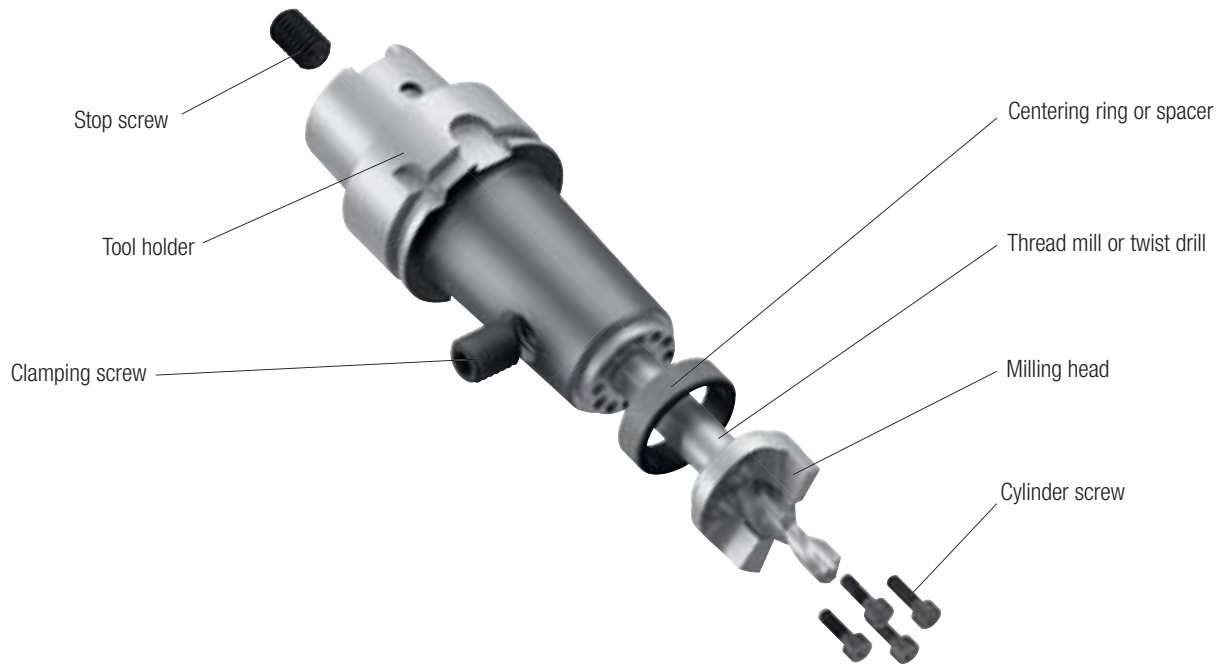
With just one clamping operation, you enjoy a number of advantages:

- Smaller tool quantities
- Fewer magazine places and reduced stocking costs
- Shorter machining times

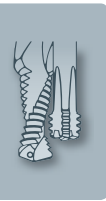
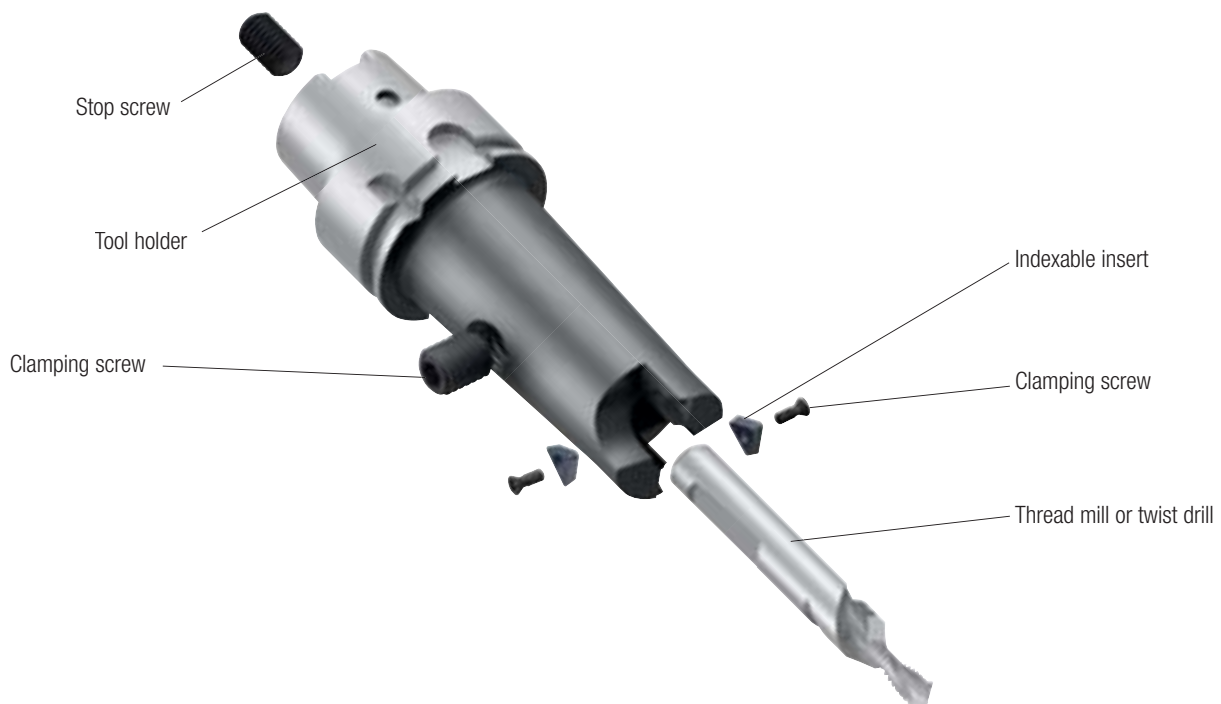
“MoSys“ answers to the following requirements:

- Easy assembly
- High degree of rigidity
- High dimensional precision
- Modular construction for universal application

#### MoSys with solid carbide head



#### MoSys with indexable inserts



ISO taper shanks



Hollow taper shanks



Connection for milling head



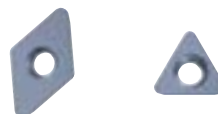
Connection for indexable inserts



Centering ring



Indexable inserts for plane milling and chamfering



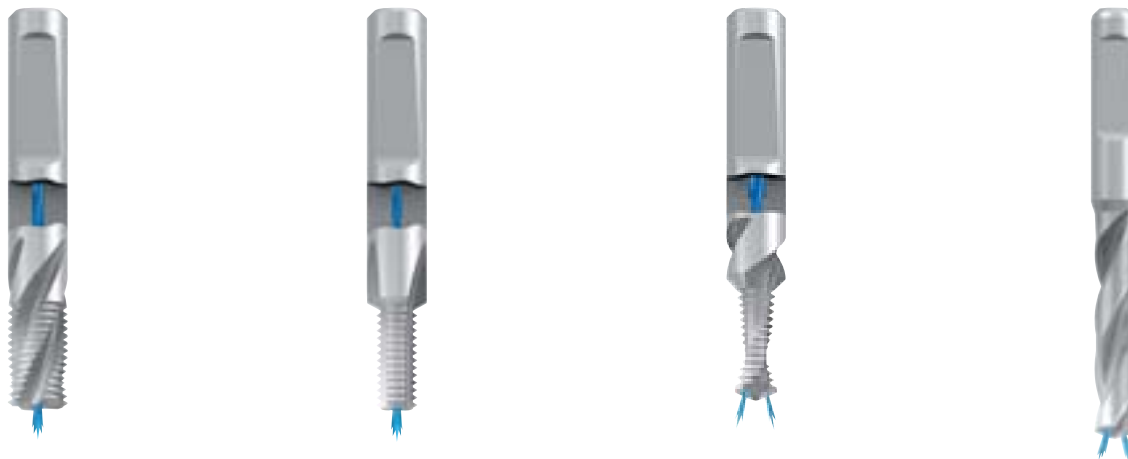
Indexable inserts for plane milling



Solid carbide milling heads



Thread mills or twist drills



- Product Finder
- V<sub>c</sub>**
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys**

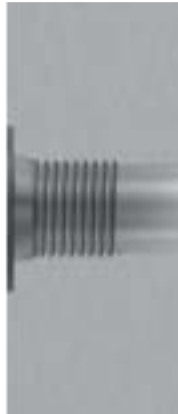


- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
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- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

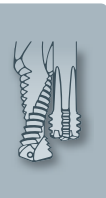
### For submitting an offer, we need the following information:

- Workpiece drawing with possible obstruction contours
- Shank connection on the machine side, with coolant supply
- Detailed countersink contour
- Size of the thread to be produced, including thread depth
- Type of hole (through hole or blind hole)
- Drilled hole diameter (if known)
- Workpiece material

### Example for machining with solid carbide head



### Example for machining with indexable inserts



## Technical information

		Page
3.1	Characteristics and advantages of thread milling	276
3.2	Our EMUGE thread mill types	277 - 278
3.3	Possible modifications on thread mills	279
3.4	Calculation of cutting data	280
3.5	Thread milling processes (right-hand thread)	281
3.6	Problems, possible causes and solutions in thread milling	282 - 283

Product  
FinderV<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

NPT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

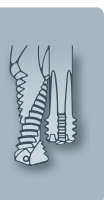
ZGF(I)

CIRC-GF

Gigant

MoSys





## 3.1 Characteristics and advantages of thread milling

**Thread milling – A technology which can reduce your production costs considerably!**

With the more and more widespread use of CNC technology, the basic conditions for a future-oriented technique of producing internal and external threads have been created.

Thread milling can be practiced without any trouble and with a high degree of process safety if your CNC machine is provided with a control for 3D-interpolation. In addition to that, you need stable and vibration-free tool and workpiece clamping, and internal coolant supply.

In case you should have little or no experience with the programming of the control, our technicians will be happy to help you by word and deed. We are also ready, at any time, to provide in-house or on-location training for you with practical machining examples.

Please contact our sales personnel.

**Thread milling is, in a multitude of application cases, a highly recommendable alternative to tapping or cold-forming of threads, with the following advantages:**

- Short production times
- High degree of process safety
- Very good surface quality
- Combination of different machining jobs with one tool
- Usable thread depth down to the very bottom of the hole
- No expensive lubricants are needed
- No chip problems, since only short milling chips are created
- No axial miscutting (overcut) of the thread
- Universal use in the most different materials up to approx. 60 HRC
- Blind hole and through hole threads produced with one tool
- Thread production independent of thread size and tolerance
- One tool only for right-hand and left-hand threads
- Low cutting forces
- Suitable also for thin-walled components



## 3.2 Our EMUGE thread mill types

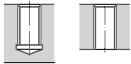
## BGF

**Solid carbide drill thread mills**

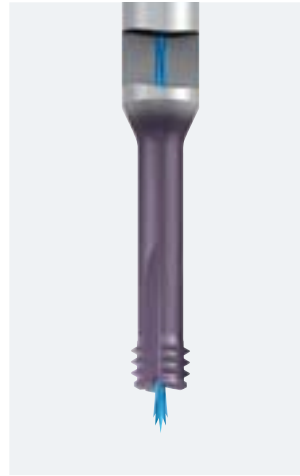
- For the production of internal threads
- For the complete machining of thread hole, chamfer and thread in one work process
- Tool for one single thread size with corrected thread profile

**Designs:**

- 2-fluted: For work in solid material
- 3-fluted: For work in pre-cast thread holes and in solid material



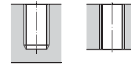
## ZBGF

**Solid carbide circular drill thread mills**

- For the production of internal threads
- For the machining of thread hole and thread in one work process
- Tool for different thread sizes but for one pitch only, with corrected thread profile

**Designs:**

- ZBGF-T: For thread depths up to 3 x D in aluminium and cast iron
- ZBGF-H: For hard machining from 44 HRC
- ZBGF-W: For the most different materials up to 44 HRC



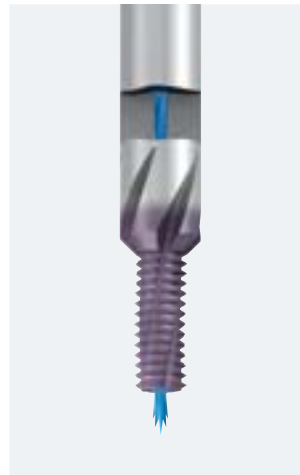
## GSF

**Solid carbide thread mills with countersinking step**

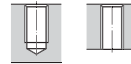
- For the production of internal threads
- For the machining of chamfer and thread in one work process
- Tool for one single thread size, with corrected thread profile
- A ready prepared thread hole is necessary



## GSF-Z

**Solid carbide thread mills with countersinking step**

- For the production of internal threads
- For the machining of chamfer and thread in one work process
- Tool for one single thread size, with corrected thread profile
- Increased number of flutes compared with type GSF
- Optimised cutting geometry
- A ready prepared thread hole is necessary



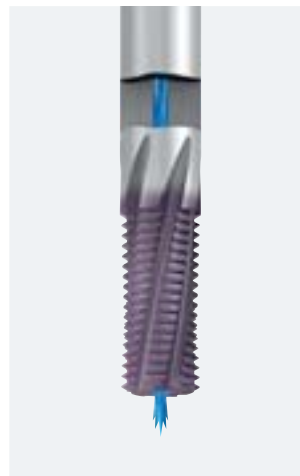
## GF

**Solid carbide thread mills**

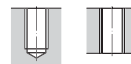
- For the production of internal and external threads
- Tool for different thread sizes with standard thread profile (but for one pitch only)
- A ready prepared thread hole is necessary, including chamfer if needed
- In order to avoid serious profile deviation in internal threads, the cutter diameter should not exceed  $\frac{2}{3}$  (with fine threads,  $\frac{3}{4}$ ) of the thread to be produced
- With external threads, the cutter diameter should not exceed the diameter of the thread to be produced



## GF-Z

**Solid carbide thread mills**

- For the production of internal threads
- Tool for different thread sizes with standard thread profile (but for one pitch only)
- Increased number of flutes compared with type GF
- Optimised cutting geometry
- A ready prepared thread hole is necessary, including chamfer if needed
- In order to avoid serious profile deviation in internal threads, the cutter diameter should not exceed  $\frac{2}{3}$  (with fine threads,  $\frac{3}{4}$ ) of the thread to be produced

Product  
FinderV<sub>c</sub>

UNC

UNF

UN

M

M

NPSF

G

Rp (BSPP)

W

BSW, BSF

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

ZGF(I)

CIRC-GF

Gigant

MoSys



- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info**
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

### 3.2 Our EMUGE thread mill types

#### GF-Vario-Z

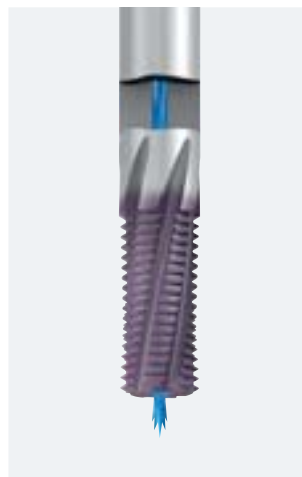


##### Solid carbide thread mills, variable

- For the production of internal threads
- Tool for different thread sizes, but for one pitch only, with corrected thread profile
- Large number of flutes
- Optimised cutting geometry
- A ready prepared thread hole is necessary, including chamfer if needed



#### GF-H



##### Solid carbide thread mills for hard machining

- For the production of internal threads
- Tool for one single thread size, with corrected thread profile
- A ready prepared thread hole is necessary, including chamfer if needed

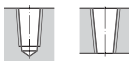


#### GF-KEG



##### Solid carbide thread mills for tapered threads

- For the production of tapered internal threads
- Tool for one single thread size, resp. for one pitch only, with corrected thread profile
- A ready prepared cylindrical, or even better, tapered, thread hole is necessary, including chamfer if needed



#### ZGF



##### Solid carbide circular thread mills

- For the production of internal threads from M1
- Tool for different thread sizes and pitches, with corrected thread profile
- A ready prepared thread hole is necessary, including chamfer if needed



#### ZIRK-GF



##### Circular thread milling bodies

- For the production of internal and external threads
- With one or two multi-tooth inserts
- Tool for different thread sizes, but for one pitch only
- A ready prepared thread hole is necessary, including chamfer if needed
- In order to avoid serious profile deviation in internal threads, the cutter diameter should not exceed  $\frac{2}{3}$  (with fine threads,  $\frac{3}{4}$ ) of the thread to be produced

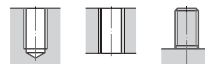


#### Gigant



##### Circular thread milling bodies

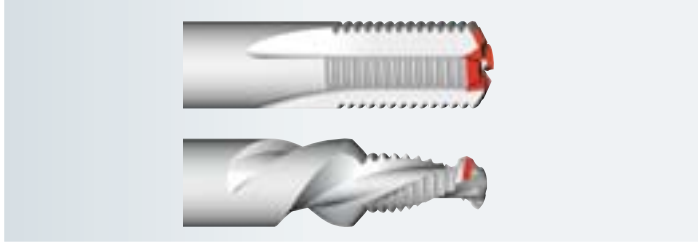
- For the production of large internal and external threads
- With up to ten 4-tooth indexable inserts (independent of pitch)
- Tool for different thread sizes and pitches
- A ready prepared thread hole is necessary, including chamfer if needed





### 3.3 Possible modifications on thread mills

#### Face chamfer (with or without cutting face)



##### Suitable for:

- All types GF and GSF
- All types BGF (face chamfer on the drilling part)

##### Note:

- Face chamfer for circular chamfering of the thread hole
- Additional cutting face for circular face milling

#### Recessed neck



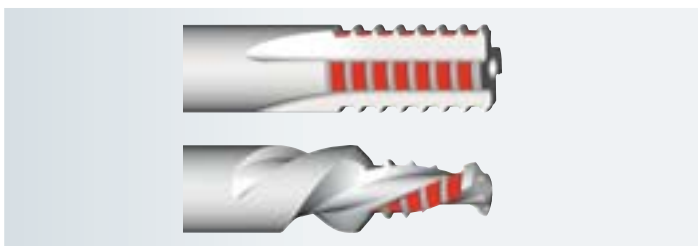
##### Suitable for:

- All types GF and GSF (no countersinking step)

##### Note:

- For larger thread depths (total thread depth is achieved by a double milling process)
- For constant cutting pressure, the thread part length and the neck length are arranged in a ratio of 1:1!
- The thread part length and the offset for a second milling process are always a whole-number multiple of the thread pitch

#### AZR – Radially alternating tooth rows



##### Suitable for:

- All types GF, GSF and BGF

##### Note:

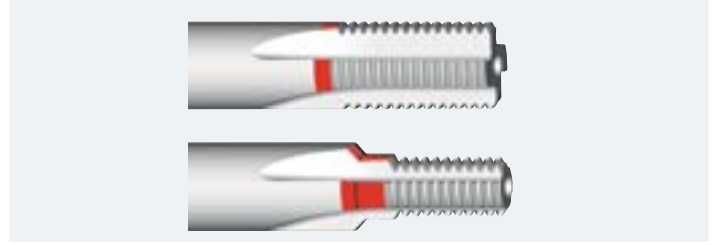
- **AZR** helps to reduce lateral forces in thread milling; the alternating missing gaps in the thread are produced by additional circular milling orbits

There is another variant, not shown here, called **AZ** (alternating teeth in a staggered sequence)

##### Advantage:

- No additional circular orbits are necessary; due to this, there is a perfectly normal recess depth at the hole bottom, if BGF type tools are used

#### Removal of incomplete thread



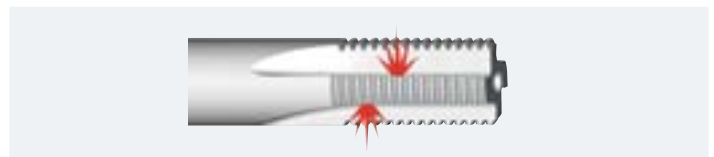
##### Suitable for:

- All types GF, GSF and BGF

##### Note:

- At the rear end of the thread part, a step with a length of min.  $1 \times P$  is relief-ground
- If the tool plunges to a correct depth during the thread milling process, the incomplete thread run-out with its burr is milled off (removed)

#### IKZN – Internal coolant supply exiting in the flutes



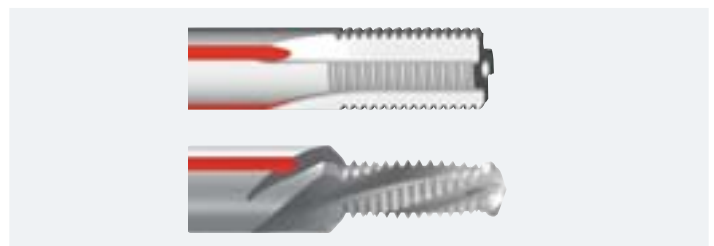
##### Suitable for:

- All types GF and GSF

##### Note:

- Axial coolant bore closed up at the tool face for the production of through hole threads
- For maximum stability of the cutting part, the lateral coolant holes are axially staggered

#### Coolant grooves along the shank



##### Suitable for:

- All types GF, GSF and BGF

##### Note:

- For the production of through hole threads
- In addition or as an alternative to IKZ or IKZN
- Possible support in the cooling of the countersinking step of GSF and BGF type tools, or of the plane milling head in MoSys applications

Product  
FinderV<sub>c</sub>

UNC

UNF

UN

M

MF

NPSF

G

Rp (BSPP)

W

BSW, BSF

PT

NPTF

Rc (BSPT)

STI

SELF-LOCK

Accessories

Tech. Info

BGF

ZBGF

GSF (Aero)

GSF-Z

GF(I), GF-Z

GF-Vario-Z

GF-H

GF(I)-KEG

ZGF(I)

CIRC-GF

Gigant

MoSys



- Product Finder
- $v_c$**
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info**
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

## 3.4 Calculation of cutting data

### Cutting speed $v_c$

$$v_c = \frac{d_1 \cdot \pi \cdot n}{12} \text{ [SFM]}$$

$d_1$  = Milling part diameter in inch  
 $n$  = Speed in rpm

$$v_c = \frac{d_1 \cdot \pi \cdot n}{1000} \text{ [m/min]}$$

$d_1$  = Milling part diameter in mm  
 $n$  = Speed in rpm

### Speed $n$

$$n = \frac{v_c \cdot 12}{d_1 \cdot \pi} \text{ [rpm]}$$

$d_1$  = Milling part diameter in inch  
 $v_c$  = Cutting speed in SFM

$$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \text{ [rpm]}$$

$d_1$  = Milling part diameter in mm  
 $v_c$  = Cutting speed in m/min

### Feed speed contour $v_f$

$$v_f = f_z \cdot Z \cdot n \text{ [inch/min]}$$

$f_z$  = Feed per tooth in inch  
 $Z$  = No. of flutes

$$v_f = f_z \cdot Z \cdot n \text{ [mm/min]}$$

$f_z$  = Feed per tooth in mm  
 $Z$  = No. of flutes

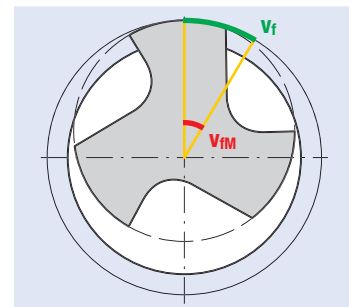
### Feed speed center orbit (with internal threads) $v_{fM}$

$$v_{fM} = \frac{v_f \cdot (D - d_1)}{D} \text{ [inch/min]}$$

$v_f$  = Feed speed in inch/min  
 $D$  = Nominal thread diameter in inch  
 $d_1$  = Milling part diameter in inch

$$v_{fM} = \frac{v_f \cdot (D - d_1)}{D} \text{ [mm/min]}$$

$v_f$  = Feed speed in mm/min  
 $D$  = Nominal thread diameter in mm  
 $d_1$  = Milling part diameter in mm



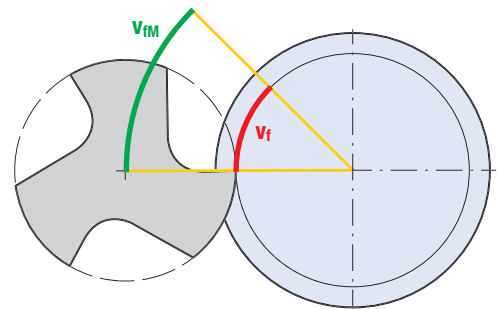
### Feed speed center orbit (with external threads) $v_{fM}$

$$v_{fM} = \frac{v_f \cdot (D + d_1)}{D} \text{ [inch/min]}$$

$v_f$  = Feed speed in inch/min  
 $D$  = Nominal thread diameter in inch  
 $d_1$  = Milling part diameter in inch

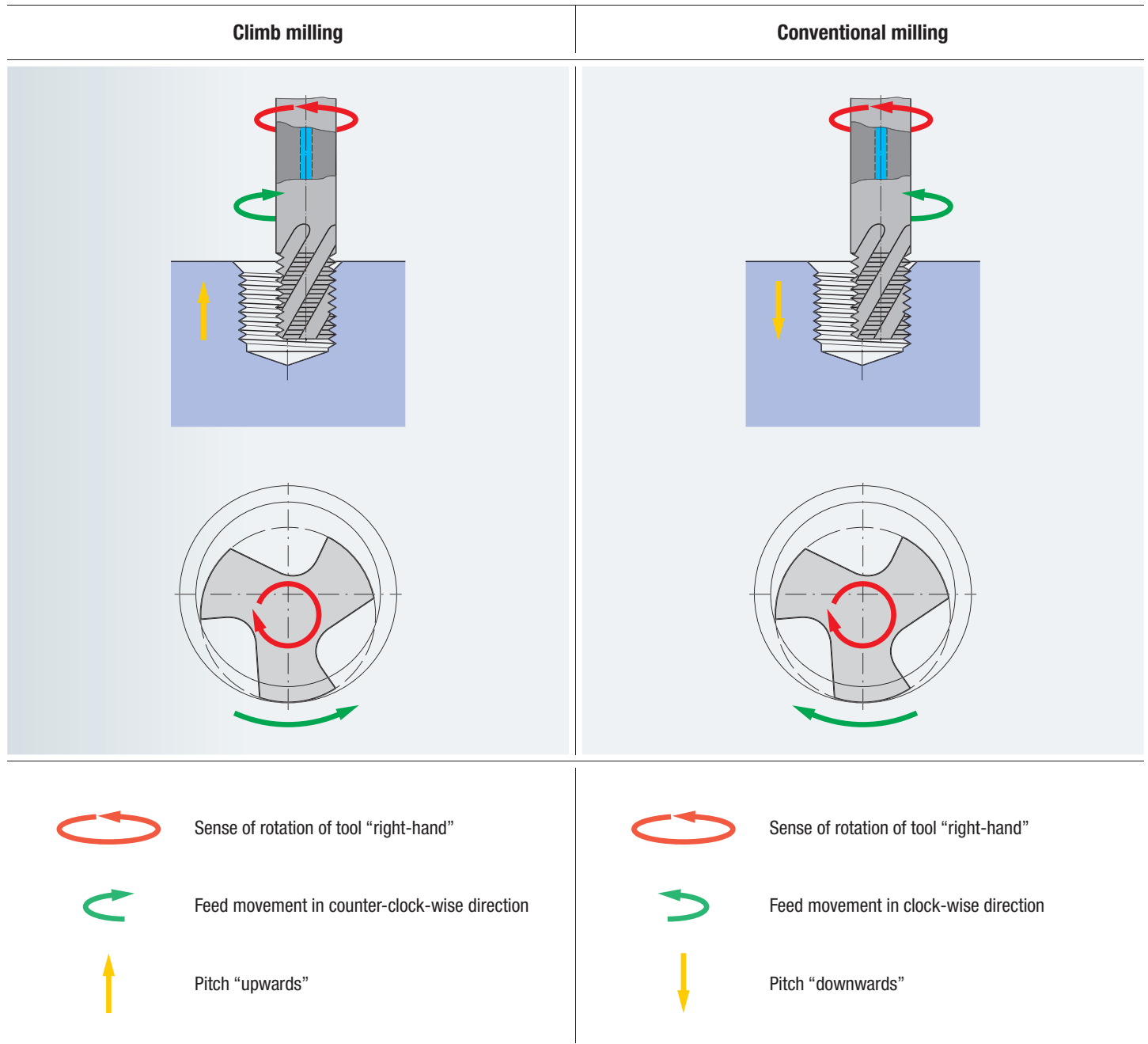
$$v_{fM} = \frac{v_f \cdot (D + d_1)}{D} \text{ [mm/min]}$$

$v_f$  = Feed speed in mm/min  
 $D$  = Nominal thread diameter in mm  
 $d_1$  = Milling part diameter in mm



The contour feed entered is recalculated to the center orbit by the machine! If this should not happen (to be recognized by the noticeably increased machining speed or by tool breakage), then the center orbit feed must be entered manually.

3.5 Thread milling processes (right-hand thread)



Product Finder

- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PPT
- NPTF
- Rc (BSPT)
- STI
- SELF-LOCK
- Accessories
- Tech. Info**
- BGF
- ZBGF
- GSF (Aero)
- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



- Product Finder
- v<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- NPT
- NPTF
- Rc (BSPT)
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- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys

## 3.6 Problems, possible causes and solutions in thread milling


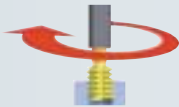


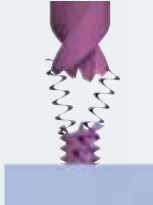
- ~ Check
- ↑ Increase
- ↓ Decrease
- CLM** Climb milling
- COM** Conventional milling

### Thread milling in general



Possible causes	Solutions			
Cutting speed	~	~	↓	
Feed per tooth	~	~	↑	↓
Stability (workpiece/workpiece clamping)	↑	↑	↑	↑
Stability (tool/machine)	↑	↑	↑	↑
Protruding length (of tool)	↓	↓	↓	~
Tool helix (spiral flutes)	↑	↑	~	~
Concentricity	~	~	~	
Coating (e.g. TiN, TiCN)			↑	↑
Milling process/program/programmed radius			CLM	CLM
Work case (relation of tool/thread diameters)				
Tool change (worn tool)				
NC axis/path speed (computer)	~	~	~	~
Drilling speed (lifting)				
Coolant-lubricant pressure (exit bore)			~	~

### 3.6 Problems, possible causes and solutions in thread milling

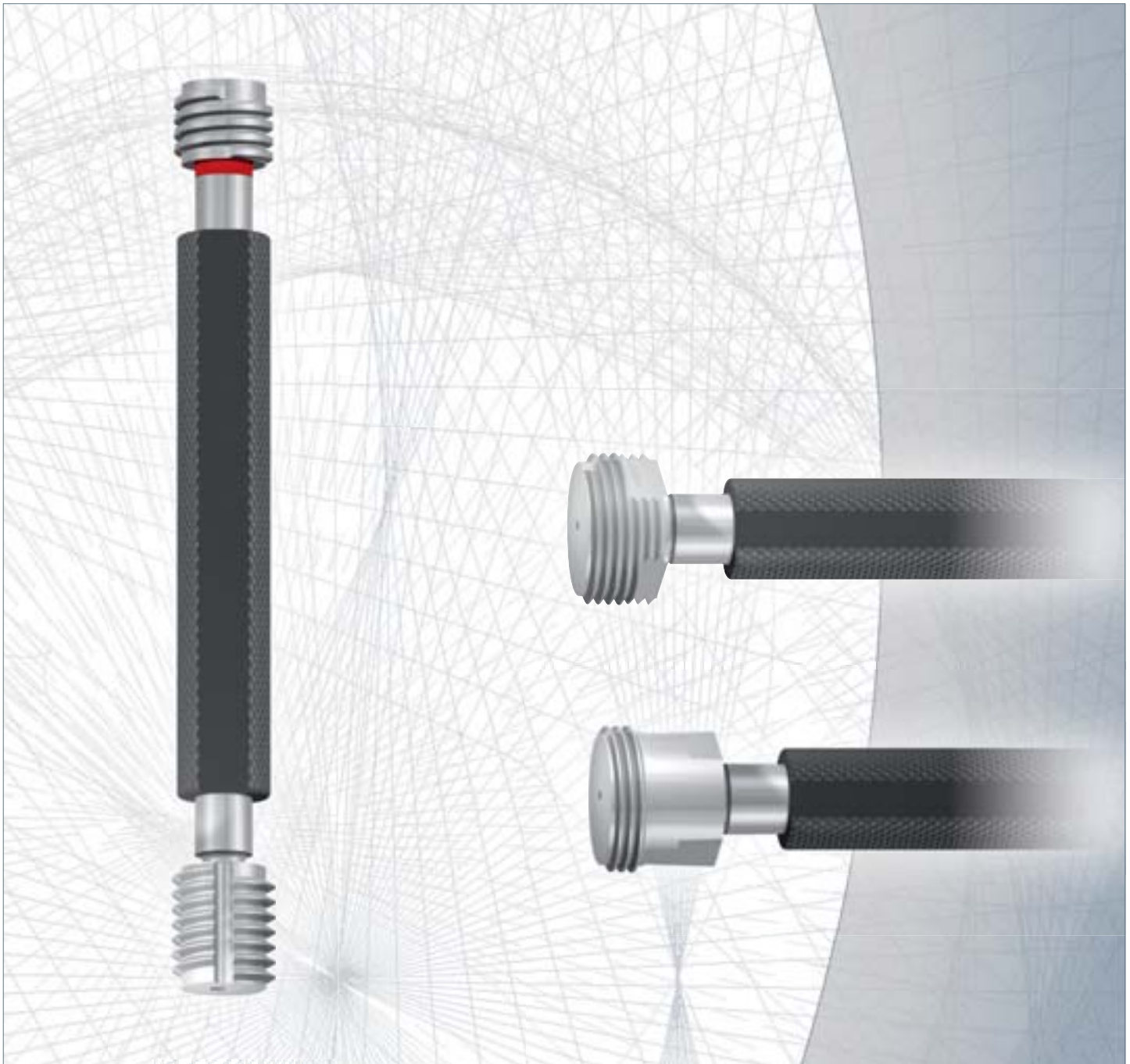
Thread milling in general			Drill thread milling	
				
Tapered thread shape (gauge jams after reaching a certain depth)	Small difference between go and no-go gaging	Marks in the run-in area	Tooth chipping on the drill thread mill	Tool breakage during the drilling process
Solutions				
			~	
↓			~	
↑		~		
↑		~		
↓				
~				
	~		~	~
COM		~	~	
	~			
	~			
~		~	~	
			~	↓ ~
			~	~

- Product Finder
- V<sub>c</sub>
- UNC
- UNF
- UN
- M
- MF
- NPSF
- G
- Rp (BSPP)
- W
- BSW, BSF
- PPT
- NPTF
- Rc (BSPT)
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- Tech. Info**
- BGF
- ZBGF
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- GSF-Z
- GF(I), GF-Z
- GF-Vario-Z
- GF-H
- GF(I)-KEG
- ZGF(I)
- CIRC-GF
- Gigant
- MoSys



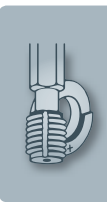
- Product Finder
- UNC
- UNF
- M
- MF
- NPT
- NPTF



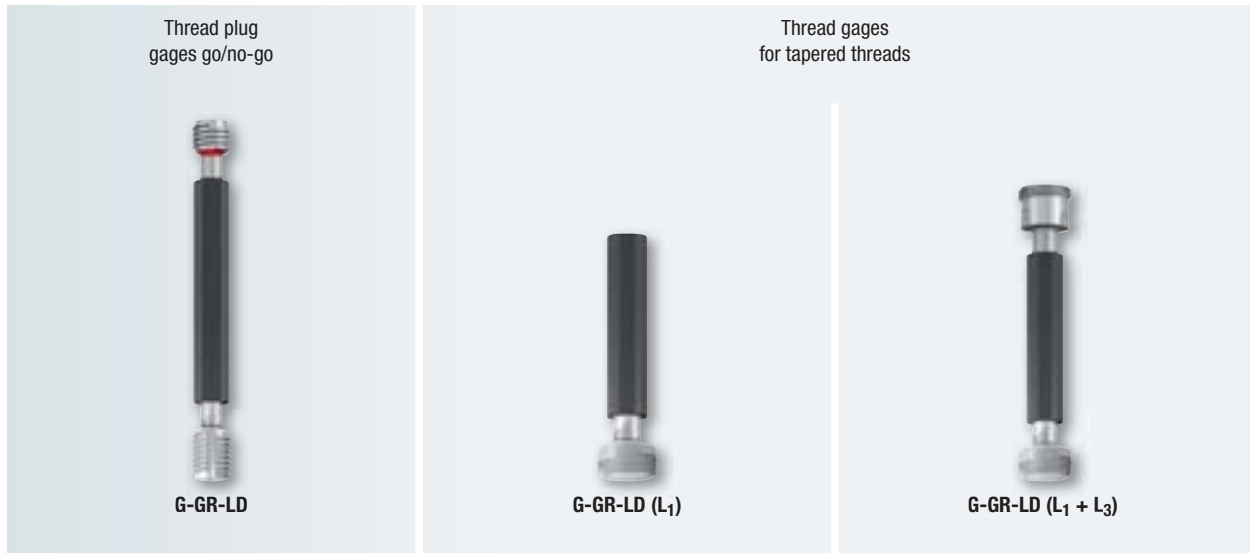


## Thread Gages

	Page
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- Product Finder
- UNC
  - UNF
  - M
  - MF
  - NPT
  - NPTF



Page

UNC	288		
UNF	289		
M	290		
MF	291		
NPT		292	
NPTF			293

### Advantages of our EMUGE thread gages

- Aged gage steel, hence extremely true-to-dimension
- Hardness noticeably over the standardized minimum requirements
- TiN coating for extra high wear resistance available on the go side
- Large stock of standard and special tolerances
- Short delivery
- Special designs available upon request
- Free-of-charge laser marking to customer's specifications on gages coming from new production and specially produced gages





EMUGE thread gages – Gaging technology to perfection

Product Finder

UNC

UNF

M

MF

NPT

NP

Starting from dia. 5.5 mm each go plug gage is provided with a dirt flute, for safe gaging even under difficult conditions

Incomplete threads are removed until the beginning of the full thread, in order to create a stable thread start

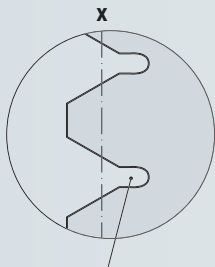
Gage handles with double surfaces for marking, leaving sufficient space for customer's specific requirements (marking to be provided by EMUGE upon request)

Knurled handles (safe handling even with greasy fingers)

Individual ident no. for each single gage for safe tracing back to production at EMUGE

Red marking of the no-go side

Reduced thread start for easy insertion of the no-go gage body



Recessed minor thread diameter of the no-go gages for safe function



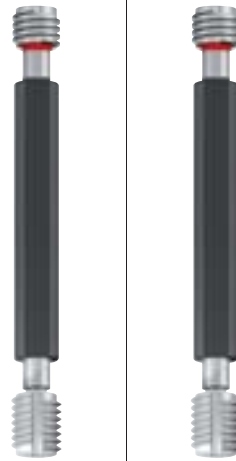
- Product Finder
- UNC**
- UNF
- M
- MF
- NPT
- NPTF



# UNC

Unified coarse thread  
ASME B1.1

Gage dimensions acc. ANSI/ASME B1.2



		Class of Fit		2B	3B		
Nominal Size ø d <sub>1</sub>	T.P.I.	Tool Identification		L0100100	L0100110		
		Dimens. ID		G-GR-LD	G-GR-LD		
		Without Certificate	With Certificate <sup>1)</sup>				
No. 1	64	.5000	.5000G	●			
No. 2	56	.5001	.5001G	●			
No. 3	48	.5002	.5002G	●			
No. 4	40	.5003	.5003G	●			
No. 5	40	.5004	.5004G	●			
No. 6	32	.5005	.5005G	●			
No. 8	32	.5006	.5006G	●			
No. 10	24	.5007	.5007G	●			
No. 12	24	.5008	.5008G	●			
1/4	20	.5009	.5009G	●			
5/16	18	.5010	.5010G	●			
3/8	16	.5011	.5011G	●	●		
7/16	14	.5012	.5012G	●	●		
1/2	13	.5013	.5013G	●	●		
9/16	12	.5014	.5014G	●	●		
5/8	11	.5015	.5015G	●	●		
3/4	10	.5016	.5016G	●	●		
7/8	9	.5017	.5017G	●			
1	8	.5018	.5018G	●			
1 1/8	7	.5019	.5019G	●			
1 1/4	7	.5020	.5020G	●			
1 3/8	6	.5021	.5021G	●			
1 1/2	6	.5022	.5022G	●			

<sup>1)</sup> These gages are available with short form certificates

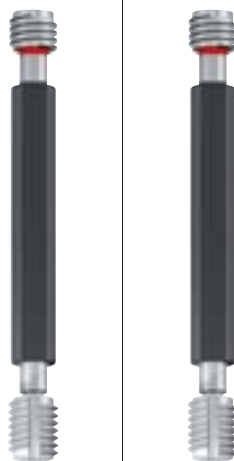


- Product Finder
- UNC
- UNF**
- M
- MF
- NPT
- NPTF



**UNF**  
 Unified fine thread  
 ASME B1.1

Gage dimensions acc. ANSI/ASME B1.2



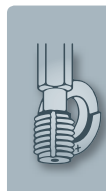
Class of Fit

2B

3B

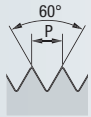
Nominal Size ø d <sub>1</sub>	T.P.I.	Tool Identification		L0100100	L0100110		
		Dimens. ID		G-GR-LD	G-GR-LD		
		Without Certificate	With Certificate <sup>1)</sup>				
No. 0	80	.5033	.5033G	●			
No. 1	72	.5034	.5034G	●			
No. 2	64	.5035	.5035G	●			
No. 3	56	.5036	.5036G	●			
No. 4	48	.5037	.5037G	●			
No. 5	44	.5038	.5038G	●			
No. 6	40	.5039	.5039G	●			
No. 8	36	.5040	.5040G	●			
No. 10	32	.5041	.5041G	●			
No. 12	28	.5042	.5042G	●			
1/4	28	.5043	.5043G	●			
5/16	24	.5044	.5044G	●			
3/8	24	.5045	.5045G	●	●		
7/16	20	.5046	.5046G	●	●		
1/2	20	.5047	.5047G	●	●		
9/16	18	.5048	.5048G	●	●		
5/8	18	.5049	.5049G	●	●		
3/4	16	.5050	.5050G	●	●		
7/8	14	.5051	.5051G	●			
1	12	.5052	.5052G	●			
1 1/8	12	.5053	.5053G	●			
1 1/4	12	.5054	.5054G	●			
1 3/8	12	.5055	.5055G	●			
1 1/2	12	.5056	.5056G	●			

<sup>1)</sup> These gages are available with short form certificates



- Product Finder
- UNC
- UNF
- M**
- MF
- NPT
- NPTF

# M



ISO Metric coarse thread  
DIN 13



Gage dimensions acc. ASME B1.16M

Class of Fit

6H

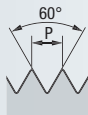
Nominal Size ø d <sub>1</sub>	P mm	Tool Identification		LU100100	G-GR-LD		
		Dimens. ID					
		Without Certificate	With Certificate <sup>1)</sup>				
M 1.6	0.35	.0016	.0016G	●			
M 2	0.4	.0020	.0020G	●			
M 2.5	0.45	.0025	.0025G	●			
M 3	0.5	.0030	.0030G	●			
M 3.5	0.6	.0035	.0035G	●			
M 4	0.7	.0040	.0040G	●			
M 5	0.8	.0050	.0050G	●			
M 6	1	.0060	.0060G	●			
M 8	1.25	.0080	.0080G	●			
M 10	1.5	.0100	.0100G	●			
M 11	1.5	.0111	.0111G	●			
M 12	1.75	.0112	.0112G	●			
M 14	2	.0114	.0114G	●			
M 16	2	.0116	.0116G	●			
M 18	2.5	.0118	.0118G	●			
M 20	2.5	.0120	.0120G	●			
M 22	2.5	.0122	.0122G	●			
M 24	3	.0124	.0124G	●			
M 30	3.5	.0130	.0130G	●			
M 36	4	.0136	.0136G	●			

<sup>1)</sup> These gages are available with short form certificates



- Product Finder
- UNC
  - UNF
  - M
  - MF**
  - NPT
  - NPTF

**MF**



ISO Metric fine thread  
DIN 13



Gage dimensions acc. ASME B1.16M

Class of Fit

6H

Nominal Size ø d <sub>1</sub>	P mm	Tool Identification		G-GR-LD			
		Dimens. ID					
		Without Certificate	With Certificate <sup>1)</sup>				
M 5	x 0.5	.0218	.0218G	●			
M 6	x 0.75	.0229	.0229G	●			
M 8	x 0.75	.0250	.0250G	●			
M 8	x 1	.0251	.0251G	●			
M 10	x 1	.0276	.0276G	●			
M 10	x 1.25	.0277	.0277G	●			
M 12	x 1.25	.0302	.0302G	●			
M 12	x 1.5	.0303	.0303G	●			
M 14	x 1.5	.0331	.0331G	●			
M 15	x 1.5	.0345	.0345G	●			
M 16	x 1.5	.0359	.0359G	●			
M 18	x 1.5	.0390	.0390G	●			
M 20	x 1.5	.0422	.0422G	●			
M 22	x 1.5	.0438	.0438G	●			

<sup>1)</sup> These gages are available with short form certificates



- Product Finder
- UNC
- UNF
- M
- MF
- NPT**
- NPTF



American tapered pipe thread,  
ANSI/ASME B1.20.1  
for threads with dryseal material,  
taper 1:16



Gage system sim. ANSI/ASME B1.20.1

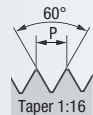
Nominal Size $\varnothing d_1$	T.P.I.	Tool Identification		L0500100 G-GR-LD (L <sub>1</sub> ) NPT			
		Dimens. ID					
		Without Certificate	With Certificate <sup>1)</sup>				
1/16	27	.5763	.5763G	●			
1/8	27	.5764	.5764G	●			
1/4	18	.5765	.5765G	●			
3/8	18	.5766	.5766G	●			
1/2	14	.5767	.5767G	●			
3/4	14	.5768	.5768G	●			
1	11 1/2	.5769	.5769G	●			

<sup>1)</sup> These gages are available with short form certificates



- Product Finder
- UNC
  - UNF
  - M
  - MF
  - NPT
  - NPTF**

# NPTF



**American tapered pipe thread, ANSI B1.20.3**  
for threads **without dryseal material**, taper 1:16



Gage system sim. ANSI/ASME B1.20.5

Nominal Size ø d <sub>1</sub>	T.P.I.	Tool Identification		L0520100 G-GR-LD (L <sub>1</sub> + L <sub>3</sub> ) NPTF			
		Dimens. ID					
		Without Certificate	With Certificate <sup>1)</sup>				
1/16	27	.5782	.5782G	●			
1/8	27	.5783	.5783G	●			
1/4	18	.5784	.5784G	●			
3/8	18	.5785	.5785G	●			
1/2	14	.5786	.5786G	●			
3/4	14	.5787	.5787G	●			

<sup>1)</sup> These gages are available with short form certificates

## Gage system NPTF-2 acc. ASME B1.20.5

### for NPTF internal thread

- L<sub>1</sub> thread plug gage ("4-step" design)
- L<sub>3</sub> thread plug gage ("4-step" design)
- Plug gage "Crest Check" ("6-step"), for checking the thread crest on the minor diameter
- Plug gage "Root Check" ("6-step"), for checking the thread root on the major diameter

### for NPTF external thread

- L<sub>1</sub> thread ring gage ("4-step" design)
- L<sub>2</sub> thread ring gage ("4-step" design)
- Ring gage "Crest Check" ("6-step"), for checking the thread crest on the major diameter
- Ring gage "Root Check" ("6-step"), for checking the thread root on the minor diameter

Thread gages go/no-go for gage system NPTF-2 upon request



- Product Finder
- UNC
- UNF
- M
- MF
- NPT
- NPTF

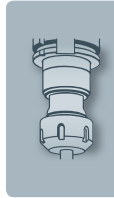














## Tap Holders and Tapping Attachments

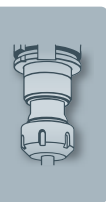
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Product pages	301 - 434
Technical information	435 - 450



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

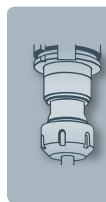
	Cooling and Lubrication				Functions						
	Internal coolant supply (IKZ)	Minimum-quantity lubrication (MQL)	Coolant pressure at the entry to the holder		Air pressure at the entry to the holder	Length compensation on compression and tension	Minimal length compensation	Length compensation on tension	Pressure-point mechanism	Front release	Axial-parallel floating
			$p_{max}$ 1400psi (100bar)	$p_{max}$ 700psi (50bar)	$p_{max}$ 85psi (6bar)						
<b>Softsynchro® Micro</b>							■				
<b>Softsynchro® 0-5</b>	■			■			■				
<b>Softsynchro® 6</b>	■			■			■				
<b>Softsynchro®/PGR</b>	■			■			■				
<b>Softsynchro®/MMS</b>		■			■		■				
<b>KSN</b>						■			■	■	
<b>KSN/HD</b>	■			■		■			■	■	
<b>KSN/HD/ER</b>	■			■		■			■		
<b>KSN/HD/PGR</b>	■			■		■			■		
<b>KSN/Synchro</b>	■		■								
<b>KSN/MQL</b>		■			■	■			■	■	
<b>SFM</b>											
<b>SFM-NP</b>											■
<b>SFM-L-DZ</b>						■			■		
<b>SWITCH-MASTER®</b>	■			■				■			
<b>GRN-NC</b>	■			■				■			
<b>SPEEDSYNCHRO®</b>	■			■			■				
<b>HF</b>						■					
<b>HF/HD/Special</b>	■			■		■					

Description of the symbols for performance characteristics, see page 436 - 438













- Product Finder
- Softsynchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEEDSYNCHRO
- HF
- EM
- Accessories
- Tech. Info

Functions			Tool Adaption				Recommended Range of Application				
Reverse gear	Overload clutch	Drilling and countersinking	Tool adaption by means of quick-change adapters, EM series	Tool adaption by means of quick-change adapters, HE series	Tool adaption by means of collets, type ER (GB)	Tool adaption by means of collets, type PGR-GB	For use on machines with synchronous spindle	For use on CNC machining centers and other machine tools	For use on multi-spindle machines and transfer lines	For use on pillar drilling machines	
											Softsynchro® Micro
					■		■				Softsynchro® 0-5
				■			■				Softsynchro® 6
						■	■				Softsynchro®/PGR
						■	■				Softsynchro®/MMS
			■					■		■	KSN
			■					■			KSN/HD
					■			■			KSN/HD/ER
						■		■			KSN/HD/PGR
						■					KSN/Synchro
			■					■			KSN/MLQ
			■						■		SFM
			■						■		SFM-NP
			■						■		SFM-L-DZ
■					■		■	■			SWITCH-MASTER®
■					■		■	■			GRN-NC
					■		■				SPEEDSYNCHRO®
	■	■		■				■		■	HF
				■				■			HF/HD/Special



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

HSK-A Shank	HSK-C Shank	Capto Shank	Cylindrical Shanks		Weldon Shank	CAT Shank	SK Shanks		
									
DIN 69893 A	DIN 69893 C	ISO 26623-1	DIN 1835 A	DIN 1835 B+E	ASME B94.19	ASME B5.50 UNC	ASME B5.50 Metric	DIN 69871 A, AD, B	DIN 2080

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<b>Softsynchro® 0-5</b>	303-304, 306	307	308	312 - 313	310	311	314			
<b>Softsynchro® 6</b>	305								315	
<b>Softsynchro®/PGR</b>	320				321					
<b>Softsynchro®/MMS</b>	360, 362	361								
<b>KSN</b>	324	325			326	327	330	329	328	331
<b>KSN/HD</b>	339	340	341		342	343			344	
<b>KSN/HD/ER</b>	349	350			351					
<b>KSN/HD/PGR</b>	352				353					
<b>KSN/Synchro</b>	354				355	356			357	
<b>KSN/MQL</b>	363, 365	364								
<b>SFM</b>										
<b>SFM-NP</b>										
<b>SFM-L-DZ</b>										
<b>HF</b>							384 - 385		384 - 385	
<b>HF/HD/Special</b>							386			

Further shank types upon request

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<b>SWITCH-MASTER®</b>		Tapping attachments with collet head	378 - 379
<b>GRN-NC</b>		Tapping attachment with collet head	380
<b>SPEEDSYNCHRO®</b>		Collet holder with integrated transmission	381 - 382

SK Shank	BT Shank	Morse Taper Shank	Trapezoidal Shank	ACME Shank	VDI Shank	ABS® Shank	Shanks for Driven Tools		
ANSI B5.18 NMPT	JIS B 6339 (MAS 403 BT)	DIN 228 B (ASME B5.10)	DIN 6327	ASME B5.11	DIN ISO 10889 (VDI 3425)	ABS®-clutch (System KOMET)	mimatic®	heimatec®	W&F

Product Finder
Softsynchro
KSN
MLQ
SFM
SWITCH-MASTER
GRN-NC
SPEED-SYNCHRO
HF
EM
Accessories
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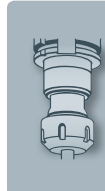
Page

										<b>Softsynchro® Micro</b>	
	316							317	318	319	<b>Softsynchro® 0-5</b>
											<b>Softsynchro® 6</b>
											<b>Softsynchro®/PGR</b>
											<b>Softsynchro®/MMS</b>
332	333	334	335	336	337	338					<b>KSN</b>
			345	346	347	348					<b>KSN/HD</b>
											<b>KSN/HD/ER</b>
											<b>KSN/HD/PGR</b>
											<b>KSN/Synchro</b>
											<b>KSN/MLQ</b>
		368	369	370							<b>SFM</b>
			371	372							<b>SFM-NP</b>
		373	374	375							<b>SFM-L-DZ</b>
384 - 385		384 - 385									<b>HF</b>
387											<b>HF/HD/Special</b>

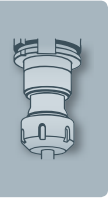
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<b>Accessories</b>		Accessories for tap holders and tapping attachments	411 - 434
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- Product Finder
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Product

Finder

Soft-

synchro

KSN

MQL

SFM

SWITCH-

MASTER

GRN-NC

SPEED-

SYNCHRO

HF

EM

Accessories

Tech. Info

## Softsynchro® Series

### Application on machines with synchronous spindle

The threading tool is pitch-controlled by the synchronous spindle; eventually arising axial forces caused by synchronisation faults are minimized by a patent-protected minimum length compensation on tension and on compression.

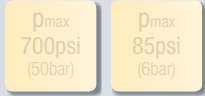


- Product Finder
- Softsynchro**
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

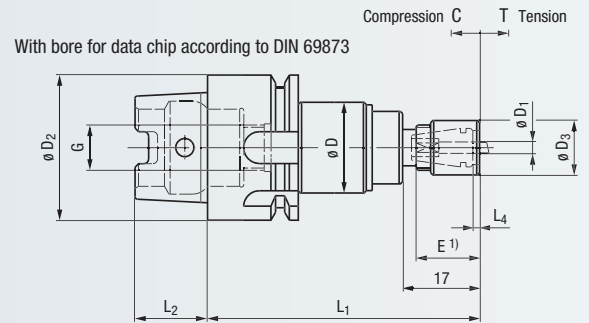
## Softsynchro®




### HSK-A Shank

DIN 69893 A



For use on machines with synchronous spindle



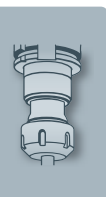
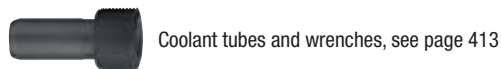
Type		Ø D <sub>1</sub>			Shank Size Ø D <sub>2</sub>	mm							EDP Number	★	
						Ø D	Ø D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>4</sub>	G	C			T
<b>Softsynchro® Micro</b>	M0.5 - M4 (No.0 - No.8)	2 - 4.5 mm 0.141 - 0.168	ER 8	Hi-Q/ERM 8	HSK-A32	20	12	60	16	1.5	M10 x 1	0.2	0.2	<b>F3150C01</b>	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut without integrated seal is included in the delivery

#### Accessories

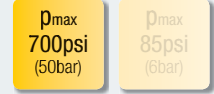
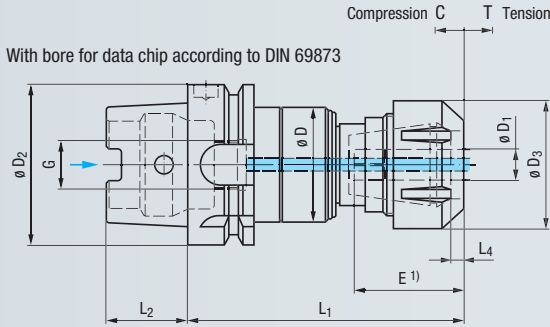




# Softsynchro®

## HSK-A Shank

DIN 69893 A



For use on machines with synchronous spindle

Type		$\varnothing D_1$			Shank Size $\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	$L_1$ ER	$L_1$ ER-GB	$L_2$	$L_4$	G	C	T	EDP Number	
Softsynchro® 0	M2 - M8 (No.2 - No.10)	2.5 - 7 mm 0.141 - 0.194	ER 11 (GB)	Hi-Q/ERM 11	HSK-A40	34	16	89.2	87.5	20	0.9	M12 x 1	0.5	0.5	F3150C02.1	★
					HSK-A50	34	16	93.2	91.5	25	0.9	M16 x 1	0.5	0.5	F3150C03.1	
					HSK-A63	34	16	95.2	93.5	32	0.9	M18 x 1	0.5	0.5	F3150C04.1	★
					HSK-A80	34	16	99.7	98	40	0.9	M20 x 1.5	0.5	0.5	F3150C05.1	
					HSK-A100	34	16	101.7	100	50	0.9	M24 x 1.5	0.5	0.5	F3150C06.1	
Softsynchro® 1	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERC 20	HSK-A40	34	34	-	89.5	20	5	M12 x 1	0.5	0.5	F3151C02.1	★
					HSK-A50	34	34	-	93.5	25	5	M16 x 1	0.5	0.5	F3151C03.1	★
					HSK-A63	34	34	-	95.5	32	5	M18 x 1	0.5	0.5	F3151C04.1	★
					HSK-A80	34	34	-	100	40	5	M20 x 1.5	0.5	0.5	F3151C05.1	★
					HSK-A100	34	34	-	102	50	5	M24 x 1.5	0.5	0.5	F3151C06.1	★
Softsynchro® 3	M4 - M20 (1/4 - 3/4)	4.5 - 16 mm 0.255 - 0.590	ER 32 (GB)	Hi-Q/ERC 32	HSK-A50	45	50	-	116.3	25	5	M16 x 1	0.5	0.5	F3153C03.1	★
					HSK-A63	45	50	-	108.8	32	5	M18 x 1	0.5	0.5	F3153C04.1	★
					HSK-A80	45	50	-	113.3	40	5	M20 x 1.5	0.5	0.5	F3153C05.1	★
					HSK-A100	45	50	-	115.3	50	5	M24 x 1.5	0.5	0.5	F3153C06.1	★
Softsynchro® 4	M12 - M30 (1/4 - 1)	9 - 22 mm 0.255 - 0.800	ER 40 (GB)	Hi-Q/ERC 40	HSK-A63	63	63	-	146.5	32	5	M18 x 1	0.7	0.7	F3154C04.1	★
					HSK-A80	63	63	-	136	40	5	M20 x 1.5	0.7	0.7	F3154C05.1	★
					HSK-A100	63	63	-	138	50	5	M24 x 1.5	0.7	0.7	F3154C06.1	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

**Softsynchro® 0**

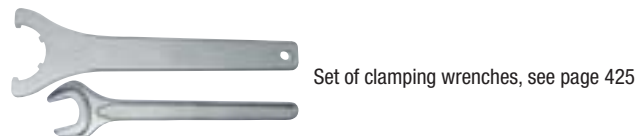
Clamping nut without integrated seal is included in the delivery

**Softsynchro® 1-4**

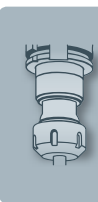
Clamping nut for sealing disks is included in the delivery

**Accessories**

- Collets type ER (GB), see page 414 - 417
- Sealing disks type DS/ER, see page 420
- Clamping nut with integrated seal, type Hi-Q/ERM 11, see page 422
- Coolant tubes and wrenches, see page 413



- Product Finder
- Softsynchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

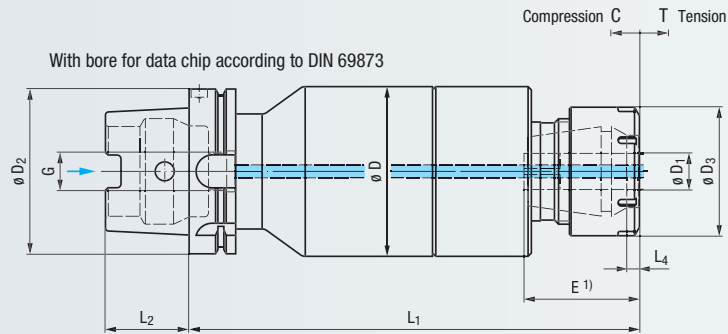
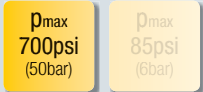


- Product Finder
- Softsynchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## Softsynchro®

### HSK-A Shank

DIN 69893 A



For use on machines with synchronous spindle

Type		$\varnothing D_1$			Shank Size $\varnothing D_2$	mm								EDP Number		
						$\varnothing D$	$\varnothing D_3$	$L_1$ ER	$L_1$ ER-GB	$L_2$	$L_4$	$G$	$C$		$T$	
Softsynchro® 5	M30 - M48	22 - 36 mm	ER 50 (GB)	Hi-Q/ERBC 50	HSK-A100	103	78	269	265.6	50	8	M24 x 1.5	2	2	F3155C06.1	★

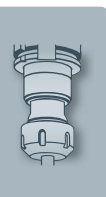
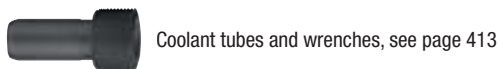
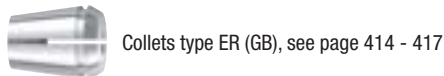
1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

Square seat for tools with shank diameter 36 mm is integrated in the tap holder body

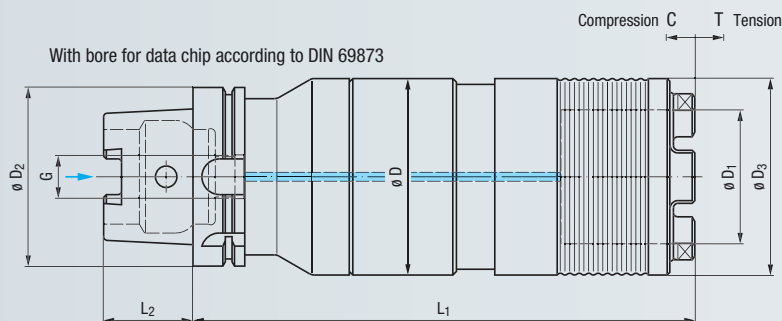
#### Accessories



# Softsynchro® HSK-A Shank DIN 69893 A



For use on machines with synchronous spindle



Type			Shank Size $\varnothing D_2$	mm							EDP Number	★	
				$\varnothing D$	$\varnothing D_1$	$\varnothing D_3$	$L_1$	$L_2$	G	C			T
Softsynchro® 6	M45 - M76 (1 3/8 - 2 3/8)	HE2/IKZZ	HSK-A100	110	75	110	281	50	M24 x 1.5	2	2	F3156C06.1	★

Further designs upon request

Accessories

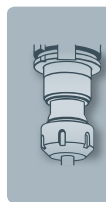


Quick-change adapters type HE2/IKZZ, see page 388



Coolant tubes and wrenches, see page 413

- Product Finder
- Softsynchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

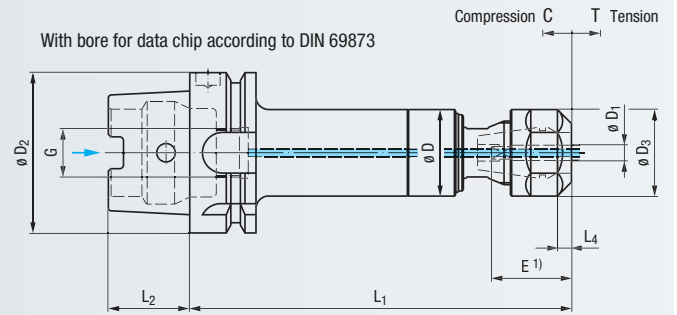
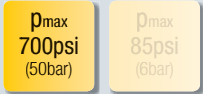
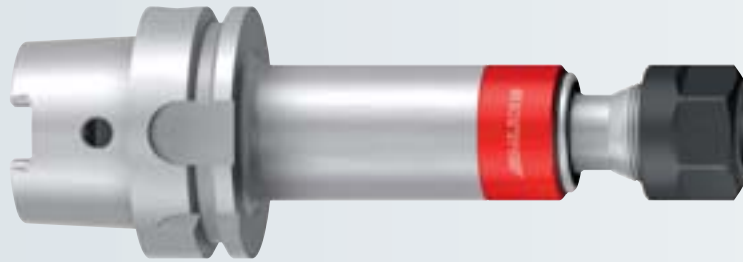


- Product Finder
- Softsynchro**
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
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- Accessories
- Tech. Info

## Softsynchro®

### HSK-A Shank

DIN 69893 A



For use on machines with synchronous spindle

Type		$\varnothing D_1$			Shank Size $\varnothing D_2$	mm							EDP Number	★	
						$\varnothing D$	$\varnothing D_3$	$L_1$	$L_2$	$L_4$	$G$	$C$			$T$
Softsynchro® 1	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERC 20	HSK-A63	34	34	125	32	5	M18 x 1	0.5	0.5	<b>F3151037.1</b>	★
					HSK-A63	34	34	150	32	5	M18 x 1	0.5	0.5	<b>F3151918.1</b>	★
					HSK-A63	34	34	175	32	5	M18 x 1	0.5	0.5	<b>F3151038.1</b>	★

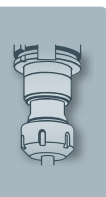
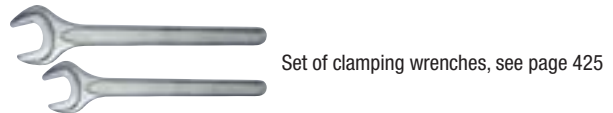
<sup>1)</sup> Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

#### Accessories

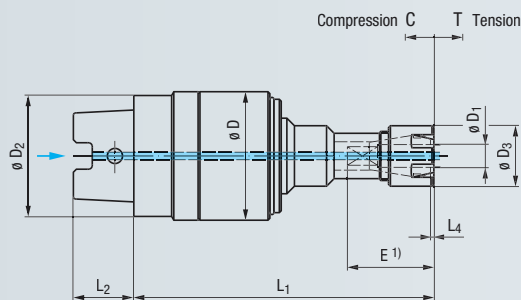
- Collets type ER (GB), see page 414 - 416
- Sealing disks type DS/ER, see page 420
- Coolant tubes and wrenches, see page 413



# Softsynchro®

## HSK-C Shank

DIN 69893 C



For use on machines with synchronous spindle

Type	Thread	$\varnothing D_1$	Collet	Sealing Disk	Shank Size $\varnothing D_2$	mm							EDP Number	★	
						$\varnothing D$	$\varnothing D_3$	$L_1$ ER	$L_1$ ER-GB	$L_2$	$L_4$	C			T
Softsynchro® 0	M2 - M8 (No.2 - No.10)	2.5 - 7 mm 0.141 - 0.194	ER 11 (GB)	Hi-Q/ERM 11	HSK-C32	34	16	81.2	79.5	16	0.9	0.5	0.5	F3150K01.1	★
					HSK-C40	34	16	81.2	79.5	20	0.9	0.5	0.5	F3150K02.1	★
Softsynchro® 1	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERC 20	HSK-C32	34	34	—	81.5	16	5	0.5	0.5	F3151K01.1	★
					HSK-C40	34	34	—	81.5	20	5	0.5	0.5	F3151K02.1	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

### Softsynchro® 0

Clamping nut without integrated seal is included in the delivery

### Softsynchro® 1

Clamping nut for sealing disks is included in the delivery

### Accessories



Collets type ER (GB), see page 414 - 416



Sealing disks type DS/ER, see page 420



Clamping nut with integrated seal, type Hi-Q/ERM 11, see page 422



Coolant tubes and wrenches, see page 413



Set of clamping wrenches, see page 425

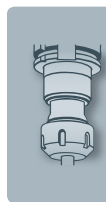


Assembly device, see page 425



Torque wrenches TORCO-FIX, see page 427

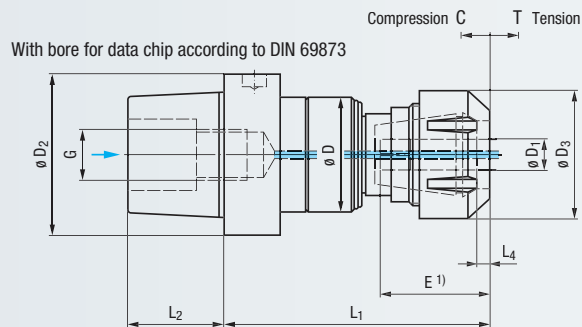
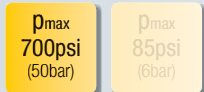
- Product Finder
- Softsynchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
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- EM
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- Tech. Info



## Softsynchro®

### Capto Shank

ISO 26623-1



For use on machines with synchronous spindle

Type	Shank Size $\varnothing D_2$	$\varnothing D_1$	ER (GB)	Hi-Q/ERM	Shank Size $\varnothing D_2$	mm										EDP Number	★
						$\varnothing D$	$\varnothing D_3$	$L_1$ ER	$L_1$ ER-GB	$L_2$	$L_4$	G	C	T			
Softsynchro® 0	M2 - M8 (No.2 - No.10)	2.5 - 7 mm 0.141 - 0.194	ER 11 (GB)	Hi-Q/ERM 11	PSC 63 (Capto C6)	34	16	95	93.2	38	0.9	M20 x 2	0.5	0.5	F3150T06.1	★	
					PSC 40 (Capto C4)	34	34	—	89.5	24	5	M14 x 1.5	0.5	0.5	F3151T04.1	★	
Softsynchro® 1	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERC 20	PSC 50 (Capto C5)	34	34	—	89.5	30	5	M16 x 1.5	0.5	0.5	F3151T05.1	★	
					PSC 63 (Capto C6)	34	34	—	93.5	38	5	M20 x 2	0.5	0.5	F3151T06.1	★	
Softsynchro® 3	M4 - M20 (1/4 - 3/4)	4.5 - 16 mm 0.255 - 0.590	ER 32 (GB)	Hi-Q/ERC 32	PSC 40 (Capto C4)	45	50	—	104	24	5	M14 x 1.5	0.5	0.5	F3153T04.1	★	
					PSC 50 (Capto C5)	45	50	—	103	30	5	M16 x 1.5	0.5	0.5	F3153T05.1	★	
					PSC 63 (Capto C6)	45	50	—	108	38	5	M20 x 2	0.5	0.5	F3153T06.1	★	
Softsynchro® 4	M12 - M30 (1/4 - 1)	9 - 22 mm 0.255 - 0.800	ER 40 (GB)	Hi-Q/ERC 40	PSC 63 (Capto C6)	63	63	—	130.5	38	5	M20 x 2	0.7	0.7	F3154T06.1	★	
					PSC 80 (Capto C8)	63	63	—	134	48	5	M20 x 2	0.7	0.7	F3154T08.1	★	

1) Clamping depth E, see page 428 - 429

Further designs upon request

#### Softsynchro® 0

Clamping nut without integrated seal is included in the delivery

#### Softsynchro® 1-4

Clamping nut for sealing disks is included in the delivery

#### Accessories



Collets type ER (GB), see page 414 - 417



Sealing disks type DS/ER, see page 420



Clamping nut with integrated seal, type Hi-Q/ERM 11, see page 422



Set of clamping wrenches, see page 425



Assembly device, see page 425

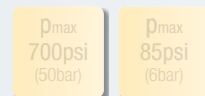
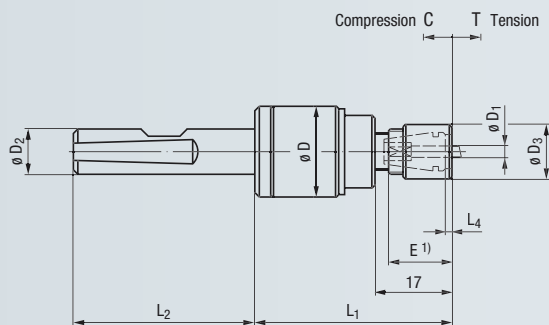


Torque wrenches TORCO-FIX, see page 427

# Softsynchro®

## Cylindrical Shank

DIN 1835 B+E



For use on machines with synchronous spindle

Type		$\phi D_1$			Shank Size $\phi D_2$ h6	$\phi D$	$\phi D_3$	$L_1$	$L_2$	$L_4$	C	T	EDP Number	
Softsynchro® Micro	M0.5 - M4 (No.0 - No.8)	2 - 4.5 mm 0.141 - 0.168	ER 8	Hi-Q/ERM 8	10	20	12	43.5	40	1.5	0.2	0.2	F3150G22	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut without integrated seal is included in the delivery

**Accessories**



Collets type ER 8, see page 416

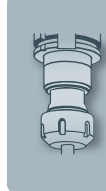


Set of clamping wrenches, see page 425



Torque wrenches TORCO-FIX, see page 427

- Product Finder
- Soft-synchro
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- SWITCH-MASTER
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- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

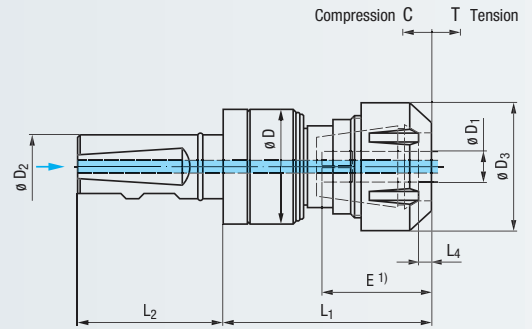
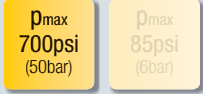


- Product Finder
- Softsynchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## Softsynchro®

### Cylindrical Shank

DIN 1835 B+E



For use on machines with synchronous spindle

Type	Shank Size	Ø D <sub>1</sub>	ER (GB)	Hi-Q/ERM	mm									EDP Number	★
					Ø D <sub>2</sub>	Ø D	Ø D <sub>3</sub>	L <sub>1</sub> ER	L <sub>1</sub> ER-GB	L <sub>2</sub>	L <sub>4</sub>	C	T		
Softsynchro® 0	M2 - M8 (No.2 - No.10)	2.5 - 7 mm 0.141 - 0.194	ER 11 (GB)	Hi-Q/ERM 11	16	34	16	72.7	71	49	0.9	0.5	0.5	F3150G24.1.44	★
					20	34	16	72.7	71	51	0.9	0.5	0.5	F3150G25.1.44	★
					25	34	16	72.7	71	57	0.9	0.5	0.5	F3150G26.1.44	★
Softsynchro® 1	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERC 20	20	34	34	-	73	51	5	0.5	0.5	F3151G25.1.44	★
					25	34	34	-	73	57	5	0.5	0.5	F3151G26.1.44	★
Softsynchro® 3	M4 - M20 (1/4 - 3/4)	4.5 - 16 mm 0.255 - 0.590	ER 32 (GB)	Hi-Q/ERC 32	25	45	50	-	87.3	57	5	0.5	0.5	F3153G26.1.44	★
Softsynchro® 4	M12 - M30 (1/4 - 1)	9 - 22 mm 0.255 - 0.800	ER 40 (GB)	Hi-Q/ERC 40	32	63	63	-	113.5	61	5	0.7	0.7	F3154G27.1	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

#### Softsynchro® 0

Clamping nut without integrated seal is included in the delivery

#### Softsynchro® 1-4

Clamping nut for sealing disks is included in the delivery

#### Accessories



Adapter shanks, see page 412



Collets type ER (GB), see page 414 - 417



Sealing disks type DS/ER, see page 420



Clamping nut with integrated seal, type Hi-Q/ERM 11, see page 422



Set of clamping wrenches, see page 425



Assembly device, see page 425



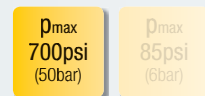
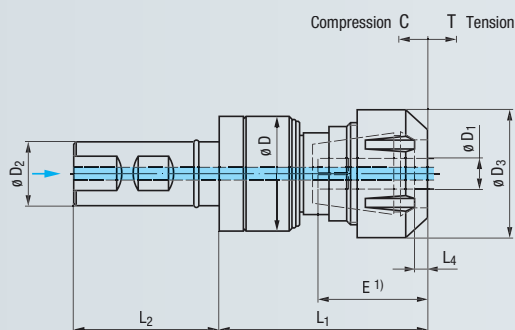
Torque wrenches TORCO-FIX, see page 427



# Softsynchro®

## Weldon Shank

ASME B94.19



For use on machines with synchronous spindle

Type	Image	$\varnothing D_1$	Image	Image	Shank Size $\varnothing D_2$	inch						EDP Number	●
						$\varnothing D$	$\varnothing D_3$	$L_1$	$L_2$	C	T		
Softsynchro® 1	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERC 20	1	1.3386	1.3386	2.8740	2.2835	0.0197	0.0197	F3151H36.1.44	●
Softsynchro® 3	M4 - M20 (1/4 - 3/4)	4.5 - 16 mm 0.255 - 0.590	ER 32 (GB)	Hi-Q/ERC 32	1	1.7717	1.9685	3.4370	2.2835	0.0197	0.0197	F3153H36.1.44	●

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

**Accessories**



Collets type ER (GB), see page 414 - 417



Sealing disks type DS/ER, see page 420



Set of clamping wrenches, see page 425

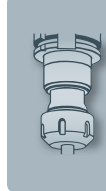


Assembly device, see page 425



Torque wrenches TORCO-FIX, see page 427

- Product Finder
- Softsynchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

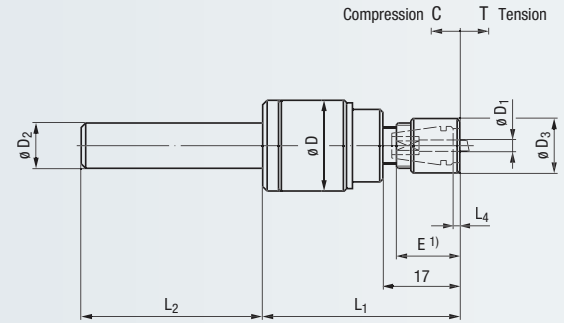
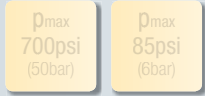


- Product Finder
- Softsynchro**
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info




## Softsynchro®

### Cylindrical Shank

DIN 1835 A



For use on machines with synchronous spindle

Type		Ø D <sub>1</sub>			Shank Size Ø D <sub>2</sub> h6	mm							EDP Number	★
						Ø D	Ø D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>4</sub>	C	T		
<b>Softsynchro® Micro</b>	M0.5 - M4 (No.0 - No.8)	2 - 4.5 mm 0.141 - 0.168	ER 8	Hi-Q/ERM 8	10	20	12	43.5	40	1.5	0.2	0.2	<b>F3150900</b>	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut without integrated seal is included in the delivery

#### Accessories



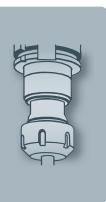
Collets type ER 8, see page 416



Set of clamping wrenches, see page 425



Torque wrenches TORCO-FIX, see page 427



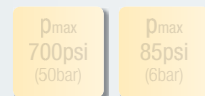
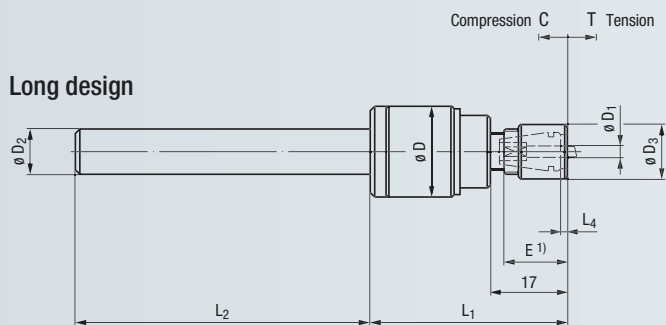
# Softsynchro®

## Cylindrical Shank

≈ DIN 1835 A



Long design



For use on machines with synchronous spindle

Type		$\varnothing D_1$			Shank Size $\varnothing D_2$ h6	$\varnothing D$	$\varnothing D_3$	$L_1$	$L_2$	$L_4$	C	T	EDP Number		
														mm	
Softsynchro® Micro	M0.5 - M4 (No.0 - No.8)	2 - 4.5 mm 0.141 - 0.168	ER 8	Hi-Q/ERM 8	10	20	12	43.5	66	1.5	0.2	0.2	F3150901	★	

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut without integrated seal is included in the delivery

**Accessories**



Collets type ER 8, see page 416

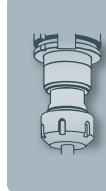


Set of clamping wrenches, see page 425



Torque wrenches TORCO-FIX, see page 427

- Product Finder
- Softsynchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

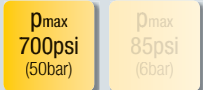


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

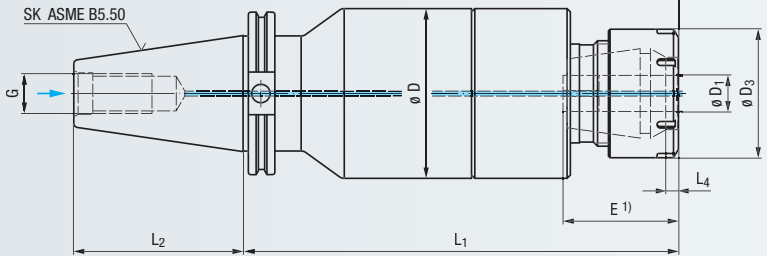
## Softsynchro®

### CAT Shank

ASME B5.50, UNC drawbolt thread



With bore for data chip according to DIN 69873



For use on machines with synchronous spindle

Type		ø D <sub>1</sub>			Shank Size	inch										EDP Number	★
						ø D	ø D <sub>3</sub>	L <sub>1</sub> ER	L <sub>1</sub> ER-GB	L <sub>2</sub>	L <sub>4</sub>	G	C	T			
Softsynchro® 5	M30 - M48	22 - 36 mm	ER 50 (GB)	Hi-Q/ERBC 50	CAT 50	3.0709	4.0551	10.5315	10.3937	4.0000	0.3150	1 - 8	0.0787	0.0787	<b>F3155783.1.16</b>		

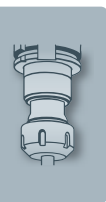
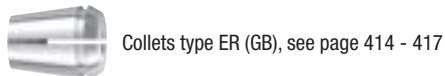
1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

Square seat for tools with shank diameter 36 mm is integrated in the tap holder body

#### Accessories



# Softsynchro®

**SK Shank**  
DIN 69871 AD



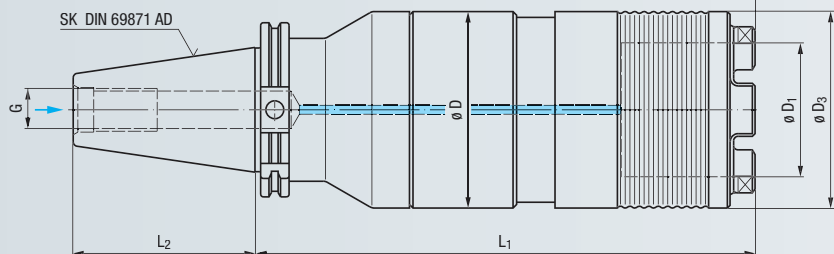
$p_{max}$   
700psi  
(50bar)

$p_{max}$   
85psi  
(6bar)



With bore for data chip according to DIN 69873

Compression C T Tension



For use on machines with synchronous spindle

Type			Shank Size	mm							EDP Number		
				$\varnothing D$	$\varnothing D_1$	$\varnothing D_3$	$L_1$	$L_2$	G	C	T		
Softsynchro® 6	M45 - M76 (1 3/8 - 2 3/8)	HE2/IKZZ	SK 50 AD	110	75	110	280	101.75	M24	2	2	F3156653.1	★

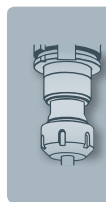
Further designs upon request

Accessories



Quick-change adapters type HE2/IKZZ, see page 388

- Product Finder
- Softsynchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

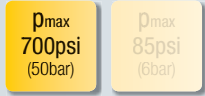


- Product Finder
- Softsynchro**
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

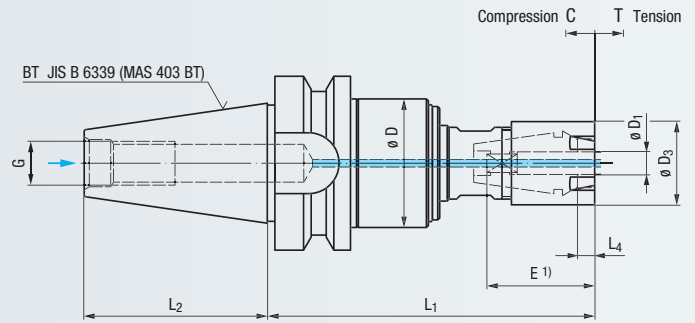
## Softsynchro®

### BT Shank

JIS B 6339 (MAS 403 BT)



For use on machines with synchronous spindle



Type	Image	ø D <sub>1</sub>	Image	Image	Shank Size	inch							EDP Number	★	
						ø D	ø D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>4</sub>	G	C			T
Softsynchro® 1	M4 - M12	4,5 - 9 mm	ER 16 (GB)	Hi-Q/ERMC 16	BT 30	1.3386	0.8661	3.4055	1.9055	0.1969	M12	0.0197	0.0197	F3151049.1	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

#### Accessories



Collets type ER (GB), see page 414 - 416



Sealing disks type DS/ER, see page 420



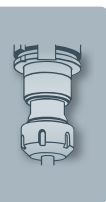
Set of clamping wrenches, see page 425



Assembly device, see page 425

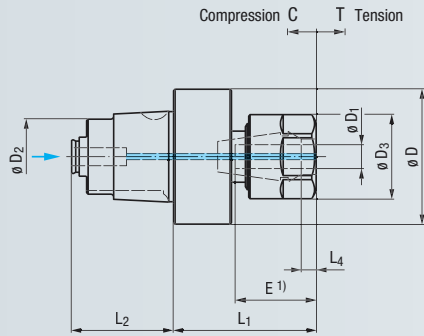


Torque wrenches TORCO-FIX, see page 427



For driven tools

# Softsynchro® mimatic®



For use on machines with synchronous spindle

Type	Thread	$\varnothing D_1$	Collet Type	Material	mm								C	T	EDP Number	
					$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	$L_1$ ER	$L_1$ ER-GB	$L_2$	$L_4$					
Softsynchro® 1	M4 - M12	4.5 - 10 mm	ER 16 (GB)	Hi-Q/ERC 16	MI 40	25	45	28	51	47.5	34	5	0.5	0.5	F3151Z40.M0100	★
					MI 50	33	55	28	48	44.5	41	5	0.5	0.5	F3151Z50.M0100	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

Square seat for tools with shank diameter 9 and 10 mm is integrated in the tap holder body

**Accessories**



Collets type ER (GB), see page 414 - 416



Sealing disks type DS/ER, see page 420

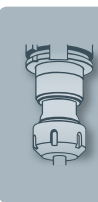


Set of clamping wrenches, see page 425



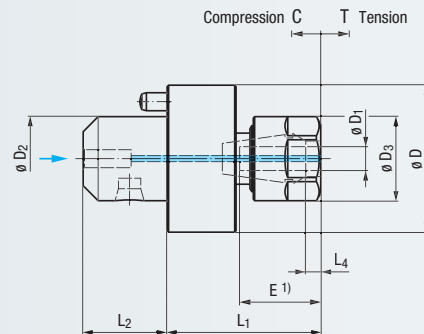
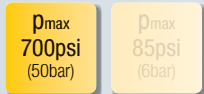
Torque wrenches TORCO-FIX, see page 427

- Product Finder
- Softsynchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



For driven tools

## Softsynchro® heimatec®



For use on machines with synchronous spindle

Type		$\varnothing D_1$				mm								EDP Number		
						$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	$L_1$ ER	$L_1$ ER-GB	$L_2$	$L_4$	C			T
Softsynchro® 1	M4 - M12	4.5 - 10 mm	ER 16 (GB)	Hi-Q/ERC 16	HT4	22	39	28	55	51.5	21.5	5	0.5	0.5	F3151Z04.H0100	★
					HT5	28	49	28	55	51.5	28	5	0.5	0.5	F3151Z05.H0100	★
					HT6	36	64	28	48	44.5	28	5	0.5	0.5	F3151Z06.H0100	★

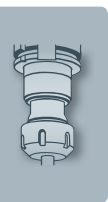
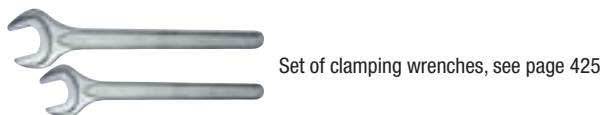
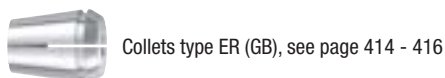
<sup>1)</sup> Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

Square seat for tools with shank diameter 9 and 10 mm is integrated in the tap holder body

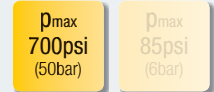
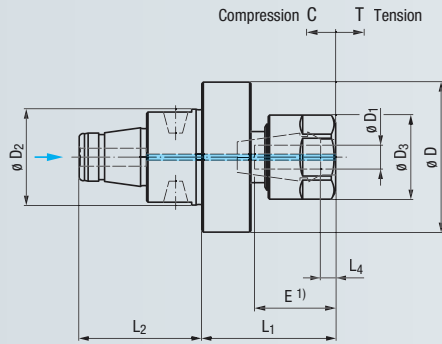
### Accessories





For driven tools

**Softsynchro®**  
W&F



For use on machines with synchronous spindle

Type		$\varnothing D_1$				mm								C	T	EDP Number	★
						$\varnothing D_2$	$\varnothing D$	$\varnothing D_3$	$L_1$ ER	$L_1$ ER-GB	$L_2$	$L_4$					
Softsynchro® 1	M4 - M12	4.5 - 10 mm	ER 16 (GB)	Hi-Q/ERC 16		WFB 32-20	32	50	28	48	44.5	41	5	0.5	0.5	F3151Z32.W0100	★
						WFB 40-25	40	63	28	48	44.5	46	5	0.5	0.5	F3151Z40.W0100	★
						WFB 50-32	48	75	28	48	44.5	54	5	0.5	0.5	F3151Z50.W0100	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

Square seat for tools with shank diameter 9 and 10 mm is integrated in the tap holder body

Accessories



Collets type ER (GB), see page 414 - 416



Sealing disks type DS/ER, see page 420



Set of clamping wrenches, see page 425



Torque wrenches TORCO-FIX, see page 427

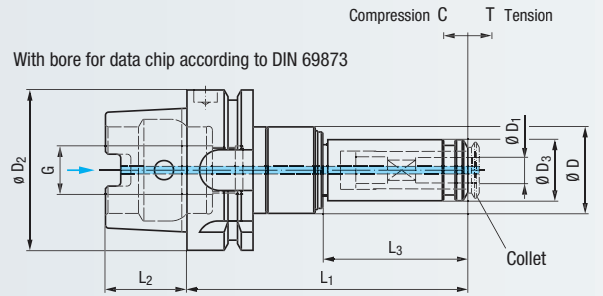
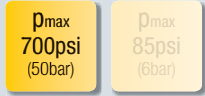
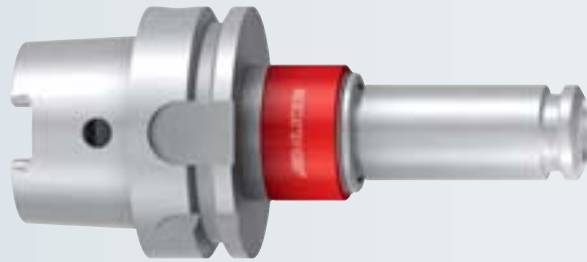


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

# Softsynchro®/PGR

## HSK-A Shank

DIN 69893 A



For use on machines with synchronous spindle

Type	Shank Size	Ø D <sub>1</sub>	Shank Size	Ø D <sub>2</sub>	mm								EDP Number
					Ø D	Ø D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	G	C	T	
Softsynchro® 1/PGR	M4 - M12 (No.10 - 1/4)	4.5 - 10 mm 0.194 - 0.255	PGR 15 GB	HSK-A50	34	24	108	25	57	M16 x 1	0.5	0.5	F3221C03.1
				HSK-A63	34	24	110	32	57	M18 x 1	0.5	0.5	F3221C04.1
				HSK-A80	34	24	114.5	40	57	M20 x 1.5	0.5	0.5	F3221C05.1
				HSK-A100	34	24	116.5	50	57	M24 x 1.5	0.5	0.5	F3221C06.1
Softsynchro® 3/PGR	M8 - M20 (1/4 - 3/4)	8 - 16 mm 0.255 - 0.590	PGR 25 GB	HSK-A50	45	40	132.5	25	67	M16 x 1	0.5	0.5	F3223C03.1
				HSK-A63	45	40	125	32	67	M18 x 1	0.5	0.5	F3223C04.1
				HSK-A80	45	40	129.5	40	67	M20 x 1.5	0.5	0.5	F3223C05.1
				HSK-A100	45	40	131.5	50	67	M24 x 1.5	0.5	0.5	F3223C06.1

Further designs upon request

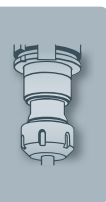
### Accessories



Collets type PGR-GB, see page 434



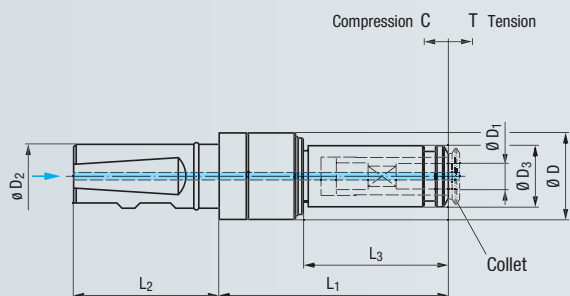
Coolant tubes and wrenches, see page 413



# Softsynchro®/PGR

## Cylindrical Shank

DIN 1835 B+E



For use on machines with synchronous spindle

Type	Image	ø D <sub>1</sub>	Image	Shank Size ø D <sub>2</sub>	mm							EDP Number	★
					ø D	ø D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	C	T		
Softsynchro® 1/PGR	M4 - M12 (No.10 - 1/4)	4.5 - 10 mm 0.194 - 0.255	PGR 15 GB	25	34	24	87.5	57	57	0.5	0.5	F3221G26.1.44	★
Softsynchro® 3/PGR	M8 - M20 (1/4 - 3/4)	8 - 16 mm 0.255 - 0.590	PGR 25 GB	25	45	40	103.5	57	67	0.5	0.5	F3223G26.1.44	★

Further designs upon request

### Accessories

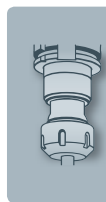


Adapter shanks, see page 412

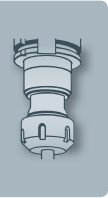


Collets type PGR-GB, see page 434

- Product Finder
- Softsynchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



- Product Finder
- Soft-synchro**
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



Product  
FinderSoft-  
synchro

KSN

MQL

SFM

SWITCH-  
MASTER

GRN-NC

SPEED-  
SYNCHRO

HF

EM

Accessories

Tech. Info

## KSN Series

### Application on CNC machining centers and conventional machine tools

The accuracy of the programmed thread depth is guaranteed by a patent-protected pressure point mechanism. Arising differences between spindle feed and thread pitch are compensated by a length compensation.



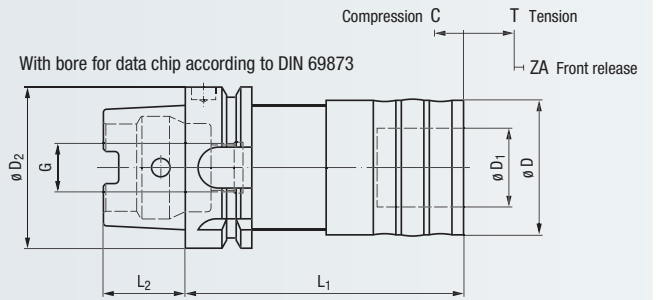
- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN HSK-A Shank DIN 69893 A



$p_{max}$   
700psi  
(50bar)

$p_{max}$   
85psi  
(6bar)



For use on CNC machining centers,  
other machine tools and pillar drilling machines

Type	Shank Size $\varnothing D_2$	mm										EDP Number	★
		$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	G	C	T	ZA				
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	HSK-A32	36	19	71	16	M10 x 1	5	8	2.1	F3301C01.30	★
			HSK-A40	36	19	73	20	M12 x 1	5	8	2.1	F3301C02.30	★
			HSK-A50	36	19	77	25	M16 x 1	5	8	2.1	F3301C03.30	★
			HSK-A63	36	19	79	32	M18 x 1	5	8	2.1	F3301C04.30	★
			HSK-A80	36	19	83.5	40	M20 x 1.5	5	8	2.1	F3301C05.30	★
			HSK-A100	36	19	85.5	50	M24 x 1.5	5	8	2.1	F3301C06.30	★
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	HSK-A40	53	31	107	20	M12 x 1	8.5	15	2.8	F3303C02.30	★
			HSK-A50	53	31	111	25	M16 x 1	8.5	15	2.8	F3303C03.30	★
			HSK-A63	53	31	113	32	M18 x 1	8.5	15	2.8	F3303C04.30	★
			HSK-A80	53	31	117.5	40	M20 x 1.5	8.5	15	2.8	F3303C05.30	★
			HSK-A100	53	31	119.5	50	M24 x 1.5	8.5	15	2.8	F3303C06.30	★
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	HSK-A63	78	48	164	32	M18 x 1	15	23.5	4.1	F3304C04.30	★
			HSK-A80	78	48	168.5	40	M20 x 1.5	15	23.5	4.1	F3304C05.30	★
			HSK-A100	78	48	170.5	50	M24 x 1.5	15	23.5	4.1	F3304C06.30	★
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	HSK-A80	96	60	203	40	M20 x 1.5	16.5	25	5.7	F3305C05.30	★
			HSK-A100	96	60	205	50	M24 x 1.5	16.5	25	5.7	F3305C06.30	★

Further designs upon request

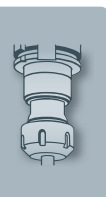
### Accessories



Quick-change adapters EM series, see page 391 - 409

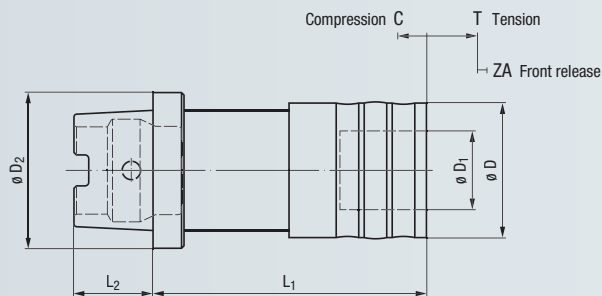
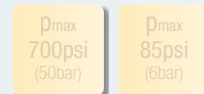


Coolant tubes and wrenches, see page 413





**KSN**  
**HSK-C Shank**  
 DIN 69893 C



For use on CNC machining centers,  
 other machine tools and pillar drilling machines

Type	Thread	EM Series	Shank Size $\varnothing D_2$	mm							EDP Number	★
				$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	C	T	ZA		
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	HSK-C32	36	19	65	16	5	8	2.1	F3301K01.30	★
			HSK-C40	36	19	65	20	5	8	2.1	F3301K02.30	★
			HSK-C50	36	19	67	25	5	8	2.1	F3301K03.30	★
			HSK-C63	36	19	67	32	5	8	2.1	F3301K04.30	★
			HSK-C80	36	19	70	40	5	8	2.1	F3301K05.30	
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	HSK-C40	53	31	99	20	8.5	15	2.8	F3303K02.30	★
			HSK-C50	53	31	101	25	8.5	15	2.8	F3303K03.30	★
			HSK-C63	53	31	101	32	8.5	15	2.8	F3303K04.30	★
			HSK-C80	53	31	104	40	8.5	15	2.8	F3303K05.30	
			HSK-C100	53	31	104	50	8.5	15	2.8	F3303K06.30	
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	HSK-C63	78	48	152	32	15	23.5	4.1	F3304K04.30	★
			HSK-C80	78	48	155	40	15	23.5	4.1	F3304K05.30	
			HSK-C100	78	48	155	50	15	23.5	4.1	F3304K06.30	
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	HSK-C80	96	60	189	40	16.5	25	5.7	F3305K05.30	
			HSK-C100	96	60	189	50	16.5	25	5.7	F3305K06.30	

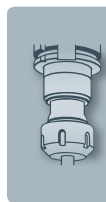
Further designs upon request

Accessories



Quick-change adapters EM series, see page 391 - 409

- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

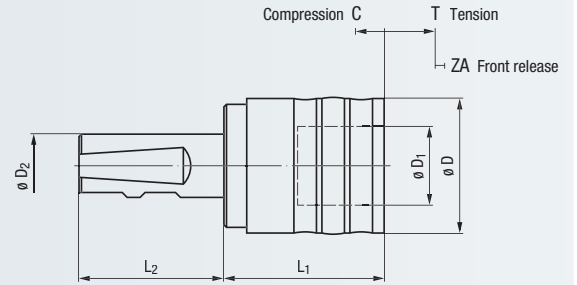
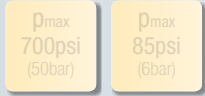


- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN

### Cylindrical Shank

DIN 1835 B+E



For use on CNC machining centers, other machine tools and pillar drilling machines

Type			Shank Size ø D <sub>2</sub>	ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	C	T	ZA	EDP Number	
KSN 0	M1 - M10 (No.0 - 1/4)	EM 00	16	26	13	38	49	5	7.5	1.7	F3300G24	★
			20	26	13	38	51	5	7.5	1.7	F3300G25	★
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	16	36	19	39	49	5	8	2.1	F3301G24	★
			20	36	19	39	51	5	8	2.1	F3301G25	★
			25	36	19	39	57	5	8	2.1	F3301G26	★
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	25	53	31	63	57	8.5	15	2.8	F3303G26	★
			32	53	31	63	61	8.5	15	2.8	F3303G27	★
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	32	78	48	124	61	15	23.5	4.1	F3304G27	★
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	40	96	60	135.5	71	16.5	25	5.7	F3305G28	★

Further designs upon request

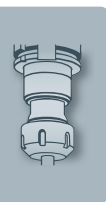
#### Accessories



Quick-change adapters EM series, see page 391 - 409



Adapter shanks, see page 412



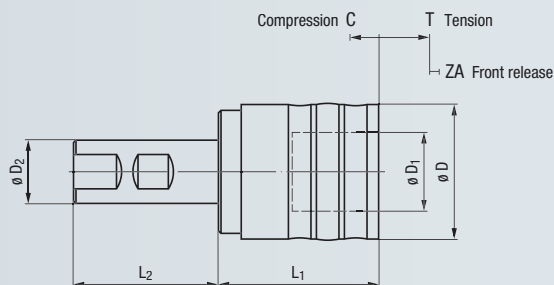
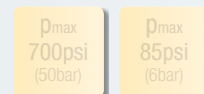




# KSN

## Weldon Shank

ASME B94.19



For use on CNC machining centers, other machine tools and pillar drilling machines

Type	Tap	Adapter	Shank Size ø D <sub>2</sub>	inch							EDP Number	
				ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	C	T	ZA		
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	1	1.4173	0.7480	1.5354	2.2835	0.1969	0.3150	0.0827	F3301H36	●
			1 1/4	1.4173	0.7480	1.5354	2.2835	0.1969	0.3150	0.0827	F3301H38	●
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	1 1/4	2.0866	1.2205	2.4803	2.2835	0.3346	0.5906	0.1102	F3303H38	●
			1 1/2	2.0866	1.2205	2.4803	2.6890	0.3346	0.5906	0.1102	F3303H40	●
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	1 1/2	3.0709	1.8898	4.8819	2.6890	0.5906	0.9252	0.1614	F3304H40	●
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	1 1/2	3.7795	2.3622	5.3346	2.6890	0.6496	0.9843	0.2244	F3305H40	●

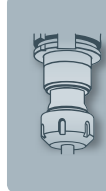
Further designs upon request

**Accessories**



Quick-change adapters EM series, see page 391 - 409

- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN

### SK Shank

DIN 69871 A



IKZ

MQL

$p_{max}$   
700psi  
(50bar)

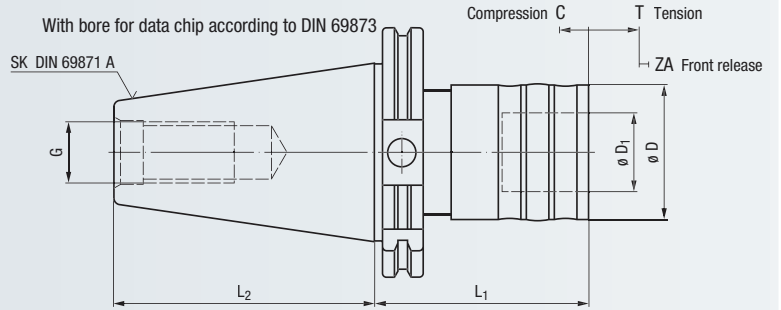
$p_{max}$   
85psi  
(6bar)

HF

EM

Accessories

Tech. Info



For use on CNC machining centers, other machine tools and pillar drilling machines

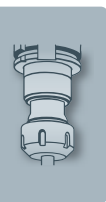
Type	Tap	Adapter	Shank Size	mm								EDP Number	★
				$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	G	C	T	ZA		
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	SK 40	36	19	60	68.4	M16	5	8	2.1	F3301651	★
			SK 50	36	19	60	101.75	M24	5	8	2.1	F3301653	★
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	SK 40	53	31	98	68.4	M16	8.5	15	2.8	F3303651	★
			SK 50	53	31	84	101.75	M24	8.5	15	2.8	F3303653	★
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	SK 40	78	48	150	68.4	M16	15	23.5	4.1	F3304651	★
			SK 50	78	48	139	101.75	M24	15	23.5	4.1	F3304653	★
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	SK 40	96	60	166	68.4	M16	16.5	25	5.7	F3305651	★
			SK 50	96	60	153	101.75	M24	16.5	25	5.7	F3305653	★

Further designs upon request

#### Accessories



Quick-change adapters EM series, see page 391 - 409





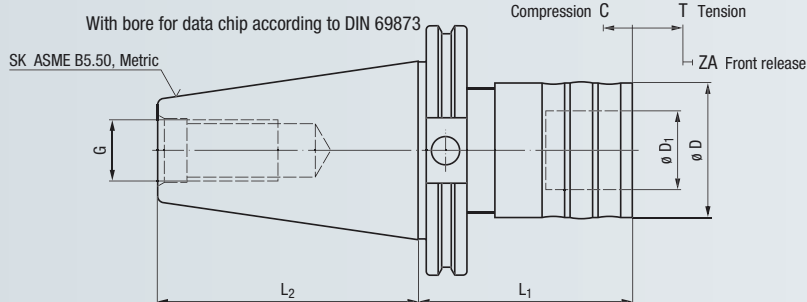
# KSN

## SK Shank

ASME B5.50, Metric drawbolt thread



- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



For use on CNC machining centers, other machine tools and pillar drilling machines

Type	Image	Image	Shank Size	mm								EDP Number	★
				ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	G	C	T	ZA		
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	SK 40 <sup>1)</sup>	36	19	74	68.25	M16	5	8	2.1	F3301781	★
			SK 50 <sup>1)</sup>	36	19	74	101.60	M24	5	8	2.1	F3301783	★
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	SK 40 <sup>1)</sup>	53	31	98	68.25	M16	8.5	15	2.8	F3303781	★
			SK 50 <sup>1)</sup>	53	31	98	101.60	M24	8.5	15	2.8	F3303783	★
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	SK 40	78	48	147	68.25	M16	15	23.5	4.1	F3304781	★
			SK 50 <sup>1)</sup>	78	48	159	101.60	M24	15	23.5	4.1	F3304783	★
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	SK 40	96	60	160	68.25	M16	16.5	25	5.7	F3305781	★
			SK 50	96	60	160	101.60	M24	16.5	25	5.7	F3305783	★

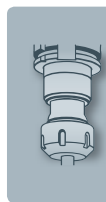
<sup>1)</sup> Adaption by DIN 1835 B

Further designs upon request

**Accessories**



Quick-change adapters EM series, see page 391 - 409

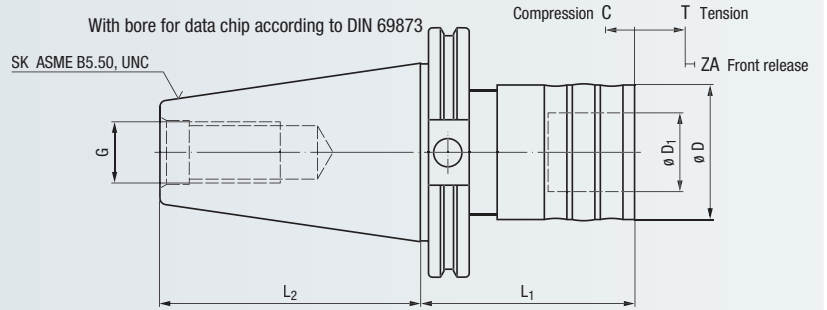
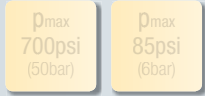


- Product Finder
- Soft-synchro
- KSN**
- SQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN

### CAT Shank

ASME B5.50, UNC drawbolt thread



For use on CNC machining centers, other machine tools and pillar drilling machines

Type	Image	Image	Shank Size	inch								EDP Number	
				ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	G	C	T	ZA		
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	CAT 40 <sup>1)</sup>	1.4173	0.7480	2.9134	2.6870	5/8 - 11	0.1969	0.3150	0.0827	F3301781.16	●
			CAT 50 <sup>1)</sup>	1.4173	0.7480	2.9134	4.0000	1 - 8	0.1969	0.3150	0.0827	F3301783.16	●
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	CAT 40 <sup>1)</sup>	2.0866	1.2205	3.8583	2.6870	5/8 - 11	0.3346	0.5906	0.1102	F3303781.16	●
			CAT 50 <sup>1)</sup>	2.0866	1.2205	3.8583	4.0000	1 - 8	0.3346	0.5906	0.1102	F3303783.16	●
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	CAT 40	3.0709	1.8898	5.7874	2.6870	5/8 - 11	0.5906	0.9252	0.1614	F3304781.16	●
			CAT 50 <sup>1)</sup>	3.0709	1.8898	6.2598	4.0000	1 - 8	0.5906	0.9252	0.1614	F3304783.16	●
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	CAT 40	3.7795	2.3622	6.2992	2.6870	5/8 - 11	0.6496	0.9843	0.2244	F3305781.16	●
			CAT 50	3.7795	2.3622	6.2992	4.0000	1 - 8	0.6496	0.9843	0.2244	F3305783.16	●

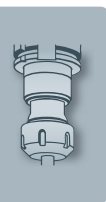
1) Adaption by DIN 1835 B

Further designs upon request

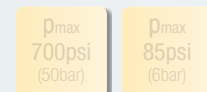
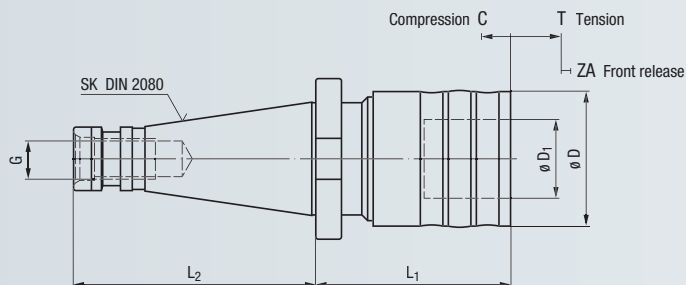
#### Accessories



Quick-change adapters EM series, see page 391 - 409



**KSN**  
**SK Shank**  
DIN 2080



For use on CNC machining centers,  
other machine tools and pillar drilling machines

Type	Thread	EM Series	Shank Size	mm								EDP Number	★
				ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	G	C	T	ZA		
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	SK 30 <sup>1)</sup>	36	19	73	68.4	M12	5	8	2.1	F3301540	★
			SK 40 <sup>1)</sup>	36	19	60.6	93.4	M16	5	8	2.1	F3301541	★
			SK 50 <sup>1)</sup>	36	19	55	126.8	M24	5	8	2.1	F3301543	★
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	SK 30	53	31	97	68.4	M12	8.5	15	2.8	F3303540	★
			SK 40 <sup>1)</sup>	53	31	84.6	93.4	M16	8.5	15	2.8	F3303541	★
			SK 50 <sup>1)</sup>	53	31	79	126.8	M24	8.5	15	2.8	F3303543	★
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	SK 40	78	48	143	93.4	M16	15	23.5	4.1	F3304541	★
			SK 50 <sup>1)</sup>	78	48	140	126.8	M24	15	23.5	4.1	F3304543	★
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	SK 40	96	60	157	93.4	M16	16.5	25	5.7	F3305541	★
			SK 50	96	60	144	126.8	M24	16.5	25	5.7	F3305543	★

<sup>1)</sup> Adaption by DIN 1835 B

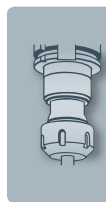
Further designs upon request

SK 40 and SK 50 shanks are equipped with a ring groove for MAHO and Deckel

Accessories



Quick-change adapters EM series, see page 391 - 409

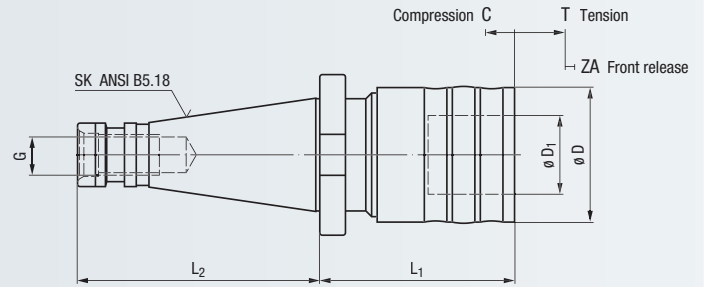
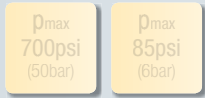


- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN

### SK Shank

ANSI B5.18, NMTP



For use on CNC machining centers, other machine tools and pillar drilling machines

Type	Image	Image	Shank Size	inch								EDP Number	★
				ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	G	C	T	ZA		
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	SK 40 1)	1.4173	0.7480	2.3858	3.6772	5/8 - 11	0.1969	0.3150	0.0827	F3301541.16	★
			SK 50 1)	1.4173	0.7480	2.1654	4.9921	1 - 8	0.1969	0.3150	0.0827	F3301543.16	★
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	SK 40 1)	2.0866	1.2205	3.3307	3.6772	5/8 - 11	0.3346	0.5906	0.1102	F3303541.16	★
			SK 50 1)	2.0866	1.2205	3.1102	4.9921	1 - 8	0.3346	0.5906	0.1102	F3303543.16	★
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	SK 40	3.0709	1.8898	5.6299	3.6772	5/8 - 11	0.5906	0.9252	0.1614	F3304541.16	★
			SK 50 1)	3.0709	1.8898	5.5118	4.9921	1 - 8	0.5906	0.9252	0.1614	F3304543.16	★
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	SK 40	3.7795	2.3622	6.1811	3.6772	5/8 - 11	0.6496	0.9843	0.2244	F3305541.16	★
			SK 50	3.7795	2.3622	5.6693	4.9921	1 - 8	0.6496	0.9843	0.2244	F3305543.16	★

1) Adaption by DIN 1835 B

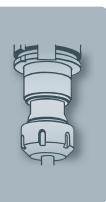
Further designs upon request

SK 40 and SK 50 shanks are equipped with a ring groove for MAHO and Deckel

#### Accessories



Quick-change adapters EM series, see page 391 - 409

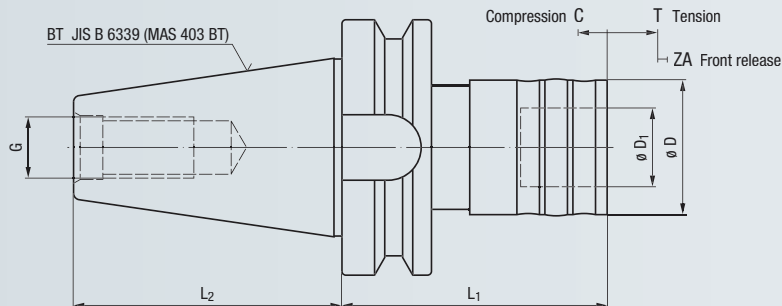
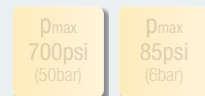




# KSN

## BT Shank

JIS B 6339 (MAS 403 BT)



For use on CNC machining centers,  
other machine tools and pillar drilling machines

Type	Image	Image	Shank Size	inch								EDP Number	★
				ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	G	C	T	ZA		
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	BT 40 <sup>1)</sup>	1.4173	0.7480	2.9134	2.5748	M16	0.1969	0.3150	0.0827	F3301891	★
			BT 50 <sup>1)</sup>	1.4173	0.7480	3.2677	4.0079	M24	0.1969	0.3150	0.0827	F3301893	★
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	BT 40 <sup>1)</sup>	2.0866	1.2205	3.8583	2.5748	M16	0.3346	0.5906	0.1102	F3303891	★
			BT 50 <sup>1)</sup>	2.0866	1.2205	4.2126	4.0079	M24	0.3346	0.5906	0.1102	F3303893	★
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	BT 40	3.0709	1.8898	6.4567	2.5748	M16	0.5906	0.9252	0.1614	F3304891	★
			BT 50 <sup>1)</sup>	3.0709	1.8898	6.6142	4.0079	M24	0.5906	0.9252	0.1614	F3304893	★
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	BT 40	3.7795	2.3622	6.5945	2.5748	M16	0.6496	0.9843	0.2244	F3305891	★
			BT 50	3.7795	2.3622	6.5157	4.0079	M24	0.6496	0.9843	0.2244	F3305893	★

<sup>1)</sup> Adaption by DIN 1835 B

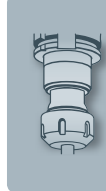
Further designs upon request

**Accessories**



Quick-change adapters EM series, see page 391 - 409

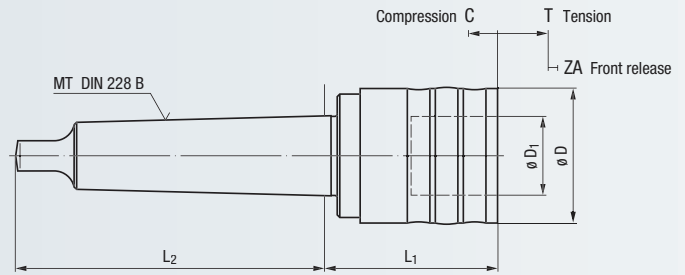
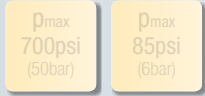
- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN Morse Taper Shank

DIN 228 B (ASME B5.10)



For use on CNC machining centers, other machine tools and pillar drilling machines

Type	Shank Size	inch									EDP Number	
		$\varnothing D$	$\varnothing D_1$	L <sub>1</sub>	L <sub>2</sub>	C	T	ZA				
KSN 0	M1 - M10 (No.0 - 1/4)	EM 00	MT 1	1.0236	0.5118	1.7126	2.4409	0.1969	0.2953	0.0669	F3300101	★
			MT 2	1.0236	0.5118	1.7717	2.9528	0.1969	0.2953	0.0669	F3300102	●
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	MT 2	1.4173	0.7480	1.8504	2.9528	0.1969	0.3150	0.0827	F3301102	●
			MT 3	1.4173	0.7480	1.8504	3.7008	0.1969	0.3150	0.0827	F3301103	●
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	MT 3	2.0866	1.2205	2.7953	3.7008	0.3346	0.5906	0.1102	F3303103	●
			MT 4	2.0866	1.2205	2.8346	4.6260	0.3346	0.5906	0.1102	F3303104	●
			MT 5	2.0866	1.2205	2.8543	5.8858	0.3346	0.5906	0.1102	F3303105	●
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	MT 4	3.0709	1.8898	4.1339	4.6260	0.5906	0.9252	0.1614	F3304104	●
			MT 5	3.0709	1.8898	4.1535	5.8858	0.5906	0.9252	0.1614	F3304105	●
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	MT 5	3.7795	2.3622	4.5866	5.8858	0.6496	0.9843	0.2244	F3305105	●
			MT 6	3.7795	2.3622	4.6654	8.2677	0.6496	0.9843	0.2244	F3305106	★

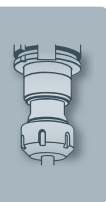
Morse taper shank with clamping thread acc. DIN 228 A upon request

Further designs upon request

### Accessories



Quick-change adapters EM series, see page 391 - 409

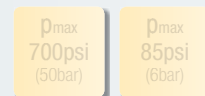
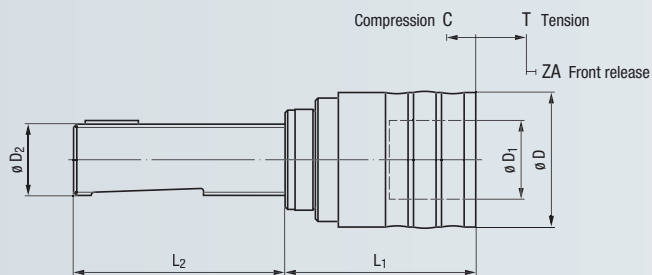




# KSN

## Trapezoidal Shank

DIN 6327



For use on CNC machining centers, other machine tools and pillar drilling machines

Type			Shank Size $\varnothing D_2$	$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	C	T	ZA	EDP Number	
KSN 0	M1 - M10 (No.0 - 1/4)	EM 00	Tr 16 x 1.5	26	13	50	73	5	7.5	1.7	F3300213	★
			Tr 20 x 2	26	13	50	76	5	7.5	1.7	F3300214	★
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	Tr 16 x 1.5	36	19	52	73	5	8	2.1	F3301213	★
			Tr 20 x 2	36	19	52	76	5	8	2.1	F3301214	★
			Tr 28 x 2	36	19	52	83	5	8	2.1	F3301216	★
			Tr 36 x 2	36	19	54	104	5	8	2.1	F3301218	★
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	Tr 20 x 2	53	31	76	76	8.5	15	2.8	F3303214	★
			Tr 28 x 2	53	31	76	83	8.5	15	2.8	F3303216	★
			Tr 36 x 2	53	31	78	104	8.5	15	2.8	F3303218	★
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	Tr 28 x 2	78	48	109	83	15	23.5	4.1	F3304216	★
			Tr 36 x 2	78	48	111	104	15	23.5	4.1	F3304218	★
			Tr 48 x 2	78	48	115	126	15	23.5	4.1	F3304219	★
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	Tr 36 x 2	96	60	122	104	16.5	25	5.7	F3305218	★
			Tr 48 x 2	96	60	126	126	16.5	25	5.7	F3305219	★

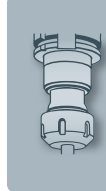
Further designs upon request

Accessories



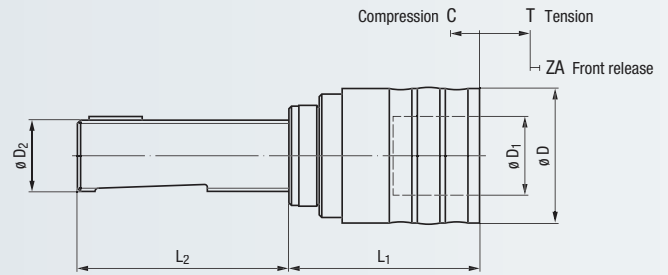
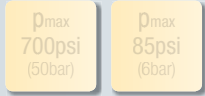
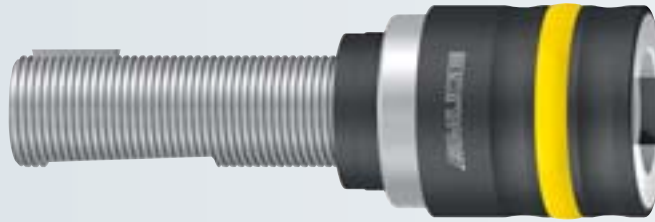
Quick-change adapters EM series, see page 391 - 409

- Product Finder
- Soft-synchro
- KSN**
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN ACME Shank ASME B5.11



For use on CNC machining centers, other machine tools and pillar drilling machines

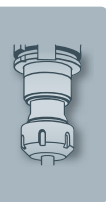
Type	Shank Size ø D <sub>2</sub> ACME	EM	inch								EDP Number	★
			ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	C	T	ZA			
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	5/8 x 16	1.4173	0.7480	1.9882	2.5787	0.1969	0.3150	0.0827	F3301M33	★
			3/4 x 12	1.4173	0.7480	1.9882	2.5787	0.1969	0.3150	0.0827	F3301M34	★
			1 1/16 x 12	1.4173	0.7480	1.9882	3.2087	0.1969	0.3150	0.0827	F3301M37	★
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	1 1/16 x 12	2.0866	1.2205	2.9331	3.2087	0.3346	0.5906	0.1102	F3303M37	★
			1 3/8 x 12	2.0866	1.2205	2.9331	4.2126	0.3346	0.5906	0.1102	F3303M39	★
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	1 3/8 x 12	3.0709	1.8898	4.2323	4.2126	0.5906	0.9252	0.1614	F3304M39	★
			1 7/8 x 12	3.0709	1.8898	4.2323	5.1772	0.5906	0.9252	0.1614	F3304M41	★

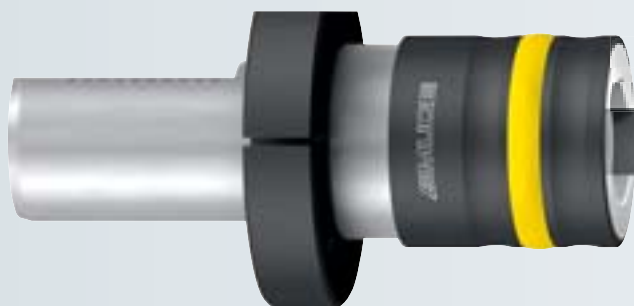
Further designs upon request

### Accessories



Quick-change adapters EM series, see page 391 - 409

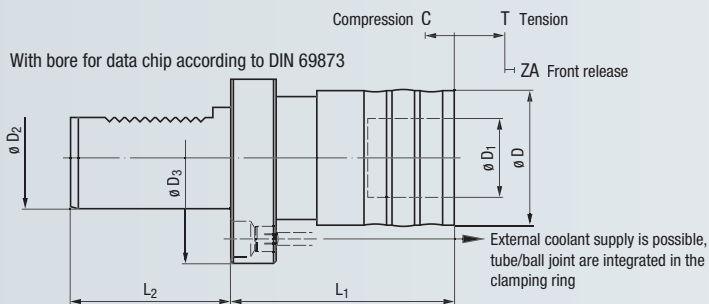
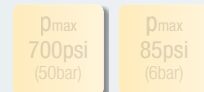




# KSN

## VDI Shank

DIN ISO 10889 (VDI 3425)



For use on CNC machining centers, other machine tools and pillar drilling machines

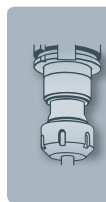
Type	Shank Size ø D <sub>2</sub>	ø D <sub>3</sub>	mm									EDP Number	★
			ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	C	T	ZA				
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	20	50	36	19	57	40	5	8	2.1	F3301430	★
			30	68	36	19	57	55	5	8	2.1	F3301431	★
			40	83	36	19	57	63	5	8	2.1	F3301432	★
			50	98	36	19	57	78	5	8	2.1	F3301433	★
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	30	68	53	31	88	55	8.5	15	2.8	F3303431	★
			40	83	53	31	88	63	8.5	15	2.8	F3303432	★
			50	98	53	31	88	78	8.5	15	2.8	F3303433	★
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	40	83	78	48	123	63	15	23.5	4.1	F3304432	★
			50	98	78	48	123	78	15	23.5	4.1	F3304433	★
			60	123	78	48	123	94	15	23.5	4.1	F3304434	★
KSN 5	M22 - M48 (7/8 - 1 7/8)	EM 05	50	98	96	60	140	78	16.5	25	5.7	F3305433	★
			60	123	96	60	140	94	16.5	25	5.7	F3305434	★

Further designs upon request

Accessories



Quick-change adapters EM series, see page 391 - 409

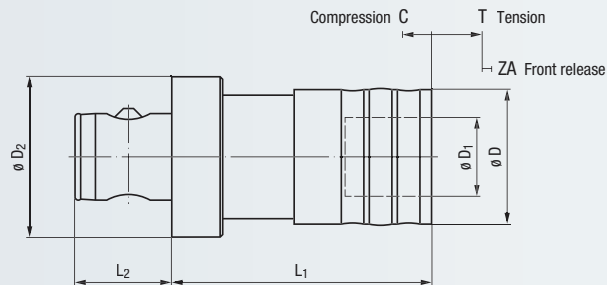
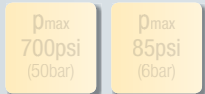


- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN

### ABS® Shank

ABS®-clutch (System KOMET)



For use on CNC machining centers, other machine tools and pillar drilling machines

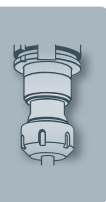
Type	Shank Size Ø D <sub>2</sub>	EM	mm								EDP Number	★
			Ø D	Ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	C	T	ZA			
KSN 1	M3 - M14 (No.0 - 9/16)	EM 01	ABS 32	36	19	72	23	5	8	2.1	F3301L01	★
			ABS 40	36	19	72	26	5	8	2.1	F3301L02	★
			ABS 50	36	19	72	31	5	8	2.1	F3301L03	★
			ABS 63	36	19	72	38	5	8	2.1	F3301L04	★
KSN 3	M4.5 - M24 (1/4 - 7/8)	EM 03	ABS 50	53	31	102	31	8.5	15	2.8	F3303L03	★
			ABS 63	53	31	102	38	8.5	15	2.8	F3303L04	★
KSN 4	M14 - M36 (5/8 - 1 3/8)	EM 04	ABS 63	78	48	155	38	15	23.5	4.1	F3304L04	★

Further designs upon request

#### Accessories

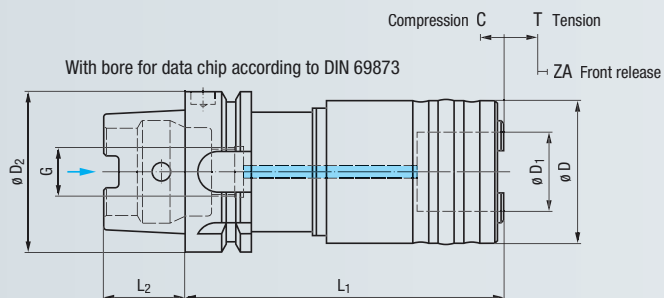
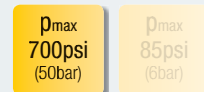


Quick-change adapters EM series, see page 391 - 409





**KSN/HD**  
**HSK-A Shank**  
 DIN 69893 A



For use on CNC machining centers and other machine tools

Type	Image	Image	Shank Size ø D <sub>2</sub>	mm								EDP Number	★
				ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	G	C	T	ZA		
KSN 1/HD	M3 - M14 (No.0 - 9/16)	EM 01	HSK-A50	40	19	91	25	M16 x 1	5	7.5	2.5	<b>F3101C03.1.30</b>	★
			HSK-A63	40	19	93	32	M18 x 1	5	7.5	2.5	<b>F3101C04.1.30</b>	★
			HSK-A80	40	19	97	40	M20 x 1.5	5	7.5	2.5	<b>F3101C05.1.30</b>	★
			HSK-A100	40	19	98	50	M24 x 1.5	5	7.5	2.5	<b>F3101C06.1.30</b>	★
KSN 3/HD	M4.5 - M24 (1/4 - 7/8)	EM 03	HSK-A50	56	31	140	25	M16 x 1	7	10	3	<b>F3103C03.1.30</b>	★
			HSK-A63	56	31	130	32	M18 x 1	7	10	3	<b>F3103C04.1.30</b>	★
			HSK-A80	56	31	133	40	M20 x 1.5	7	10	3	<b>F3103C05.1.30</b>	★
			HSK-A100	56	31	135	50	M24 x 1.5	7	10	3	<b>F3103C06.1.30</b>	★

Further designs upon request

Accessories

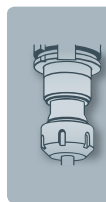


Quick-change adapters EM series, see page 391 - 409



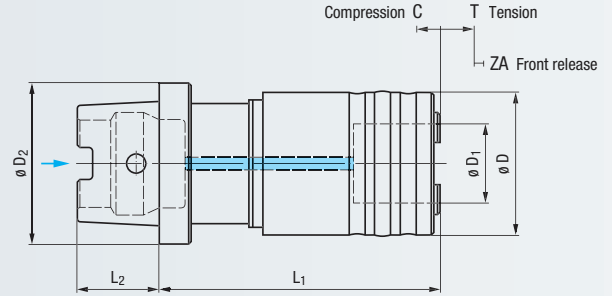
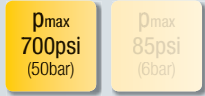
Coolant tubes and wrenches, see page 413

- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN/HD HSK-C Shank DIN 69893 C



For use on CNC machining centers and other machine tools

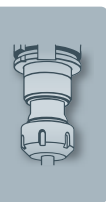
Type			Shank Size $\phi D_2$	$\phi D$	$\phi D_1$	$L_1$	$L_2$	C	T	ZA	EDP Number	
KSN 1/HD	M3 - M14 (No.0 - 9/16)	EM 01	HSK-C40	40	19	75	20	5	7.5	2.5	F3101K02.1.30	★
			HSK-C50	40	19	78	25	5	7.5	2.5	F3101K03.1.30	★
			HSK-C63	40	19	78	32	5	7.5	2.5	F3101K04.1.30	★
			HSK-C80	40	19	81	40	5	7.5	2.5	F3101K05.1.30	
			HSK-C100	40	19	81	50	5	7.5	2.5	F3101K06.1.30	
KSN 3/HD	M4.5 - M24 (1/4 - 7/8)	EM 03	HSK-C50	56	31	118	25	7	10	3	F3103K03.1.30	★
			HSK-C63	56	31	110	32	7	10	3	F3103K04.1.30	★
			HSK-C80	56	31	113	40	7	10	3	F3103K05.1.30	
			HSK-C100	56	31	115	50	7	10	3	F3103K06.1.30	

Further designs upon request

### Accessories



Quick-change adapters EM series, see page 391 - 409

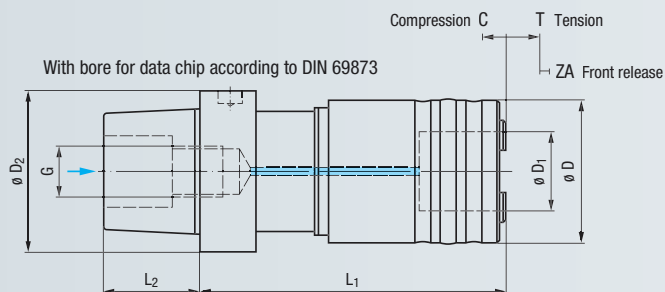




# KSN/HD

## Capto Shank

ISO 26623-1



For use on CNC machining centers and other machine tools

Type	Image	Image	Shank Size $\varnothing D_2$	mm								EDP Number	★
				$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	G	C	T	ZA		
KSN 1/HD	M3 - M14 (No.0 - 9/16)	EM 01	PSC 63 (Capto C6)	40	19	86.5	38	M20 x 2	5	7.5	2.5	F3101T06.1	★
KSN 3/HD	M4.5 - M24 (1/4 - 7/8)	EM 03	PSC 63 (Capto C6)	56	31	120	38	M20 x 2	7	10	3	F3103T06.1	★

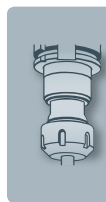
Further designs upon request

**Accessories**



Quick-change adapters EM series, see page 391 - 409

- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

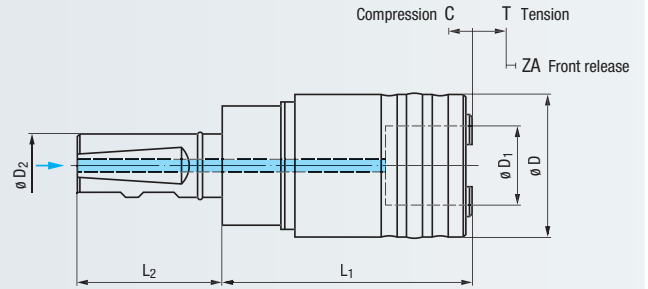
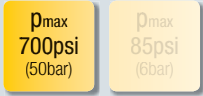


- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN/HD

### Cylindrical Shank

DIN 1835 B+E



For use on CNC machining centers and other machine tools

Type			Shank Size $\varnothing D_2$	mm							EDP Number	
				$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	C	T	ZA		
KSN 1/HD	M3 - M14 (No.0 - 9/16)	EM 01	25	40	19	62	57	5	7.5	2.5	F3101G26.1	★
KSN 3/HD	M4.5 - M24 (1/4 - 7/8)	EM 03	25	56	31	98	57	7	10	3	F3103G26.1	★
KSN 4/HD	M14 - M36 (5/8 - 1 3/8)	EM 04	32	80	48	147	61	15	20	5	F3104G27.1	★

Further designs upon request

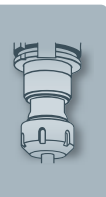
#### Accessories



Quick-change adapters EM series, see page 391 - 409



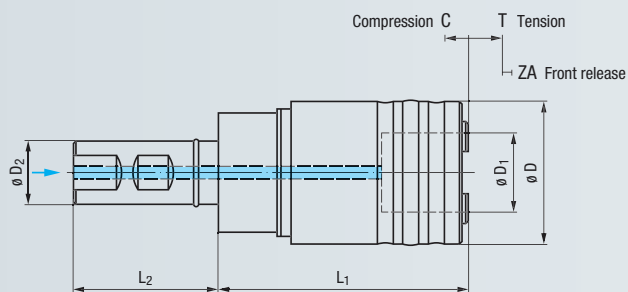
Adapter shanks, see page 412







**KSN/HD**  
Weldon Shank  
ASME B94.19



For use on CNC machining centers and other machine tools

Type	Shank Size ø D <sub>2</sub>	inch									EDP Number	
		ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	C	T	ZA				
KSN 1/HD	M3 - M14 (No.0 - 9/16)	EM 01	1	1.5748	0.7480	2.4409	2.2835	0.1969	0.2953	0.0984	F3101H36.1	●
			1 1/4	1.5748	0.7480	2.4409	2.2835	0.1969	0.2953	0.0984	F3101H38.1	●
KSN 3/HD	M4.5 - M24 (1/4 - 7/8)	EM 03	1 1/4	2.2047	1.2205	3.8583	2.2835	0.2756	0.3937	0.1181	F3103H38.1	●
			1 1/2	2.2047	1.2205	3.8583	2.6890	0.2756	0.3937	0.1181	F3103H40.1	●
KSN 4/HD	M14 - M36 (5/8 - 1 3/8)	EM 04	1 1/2	3.1496	1.8898	5.7874	2.6890	0.5906	0.7874	0.1969	F3104H40.1	●

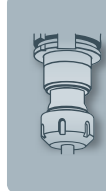
Further designs upon request

Accessories



Quick-change adapters EM series, see page 391 - 409

- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

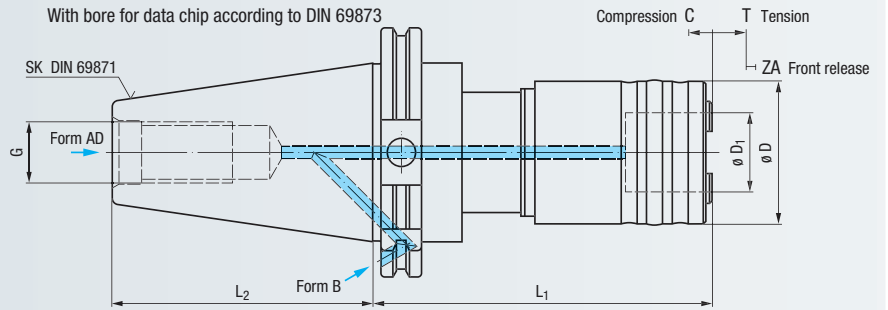
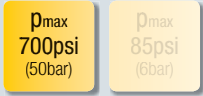


- Product Finder
- Soft-synchro
- KSN**
- SQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN/HD

### SK Shank

DIN 69871 AD, DIN 69871 B



For use on CNC machining centers and other machine tools

Type	Image	Shank Size 1)	mm								EDP Number	★	
			ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	G	C	T	ZA			
KSN 1/HD	M3 - M14 (No.0 - 9/16)	EM 01	SK 40 AD	40	19	97	68.4	M16	5	7.5	2.5	F3101651.1	★
			SK 40 B	40	19	97	68.4	M16	5	7.5	2.5	F3101651.2	★
			SK 50 AD	40	19	97	101.75	M24	5	7.5	2.5	F3101653.1	★
			SK 50 B	40	19	97	101.75	M24	5	7.5	2.5	F3101653.2	★
KSN 3/HD	M4.5 - M24 (1/4 - 7/8)	EM 03	SK 40 AD	56	31	133	68.4	M16	7	10	3	F3103651.1	★
			SK 40 B	56	31	133	68.4	M16	7	10	3	F3103651.2	★
			SK 50 AD	56	31	133	101.75	M24	7	10	3	F3103653.1	★
			SK 50 B	56	31	133	101.75	M24	7	10	3	F3103653.2	★

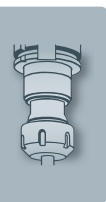
1) Adaption by DIN 1835 B

Further designs upon request

#### Accessories



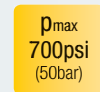
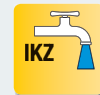
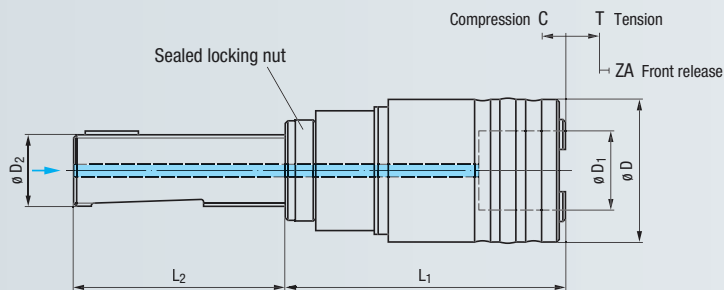
Quick-change adapters EM series, see page 391 - 409



# KSN/HD

## Trapezoidal Shank

DIN 6327



For use on CNC machining centers and other machine tools

Type	Shank Size ø D <sub>2</sub>	mm									EDP Number	★
		ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	C	T	ZA				
KSN 1/HD	M3 - M14 (No.0 - 9/16)	EM 01	Tr 20 x 2	40	19	79	71	5	7.5	2.5	F3101214.1	★
			Tr 28 x 2	40	19	80	77	5	7.5	2.5	F3101216.1	★
KSN 3/HD	M4.5 - M24 (1/4 - 7/8)	EM 03	Tr 28 x 2	56	31	116	77	7	10	3	F3103216.1	★
			Tr 36 x 2	56	31	118	98	7	10	3	F3103218.1	★

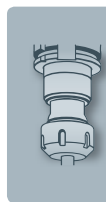
Further designs upon request

Accessories



Quick-change adapters EM series, see page 391 - 409

- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

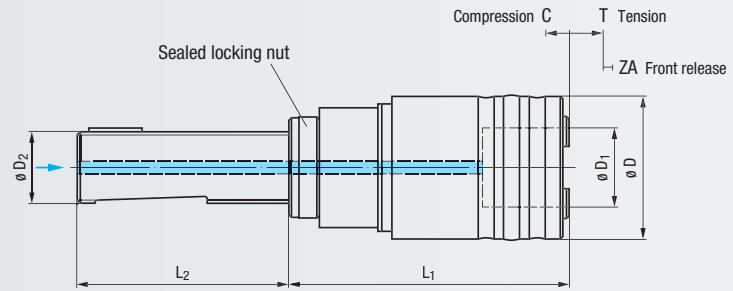
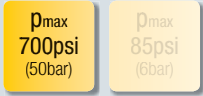


- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN/HD

### ACME Shank

ASME B5.11



For use on CNC machining centers and other machine tools

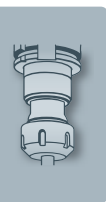
Type	Shank Size ø D <sub>2</sub> ACME	inch									EDP Number	★
		ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	C	T	ZA				
KSN 1/HD	M3 - M14 (No.0 - 9/16)	EM 01	3/4 x 12	1.5748	0.7480	3.1890	2.2441	0.1969	0.2953	0.0984	F3101M34.1	★
			1 1/16 x 12	1.5748	0.7480	3.1890	2.8740	0.1969	0.2953	0.0984	F3101M37.1	★
KSN 3/HD	M4.5 - M24 (1/4 - 7/8)	EM 03	1 1/16 x 12	2.2047	1.2205	4.6063	2.8740	0.2756	0.3937	0.1181	F3103M37.1	★
			1 3/8 x 12	2.2047	1.2205	4.6063	3.8780	0.2756	0.3937	0.1181	F3103M39.1	★

Further designs upon request

#### Accessories



Quick-change adapters EM series, see page 391 - 409

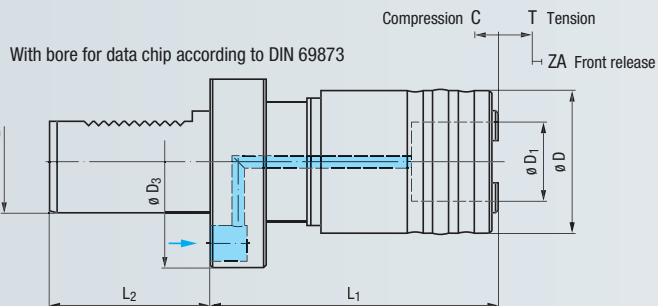




# KSN/HD

## VDI Shank

DIN ISO 10889 (VDI 3425)



For use on CNC machining centers and other machine tools

Type			Shank Size		mm							EDP Number	
			$\varnothing D_2$	$\varnothing D_3$	$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	C	T	ZA		
KSN 1/HD	M3 - M14 (No.0 - 9/16)	EM 01	30	68	40	19	77	55	5	7.5	2.5	F3101431.1	★
			40	83	40	19	77	63	5	7.5	2.5	F3101432.1	★
			50	98	40	19	77	78	5	7.5	2.5	F3101433.1	★
KSN 3/HD	M4.5 - M24 (1/4 - 7/8)	EM 03	30	68	56	31	113	55	7	10	3	F3103431.1	★
			40	83	56	31	113	63	7	10	3	F3103432.1	★
			50	98	56	31	113	78	7	10	3	F3103433.1	★

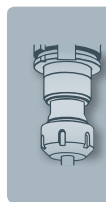
Further designs upon request

Accessories



Quick-change adapters EM series, see page 391 - 409

- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

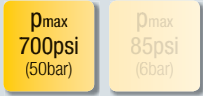


- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

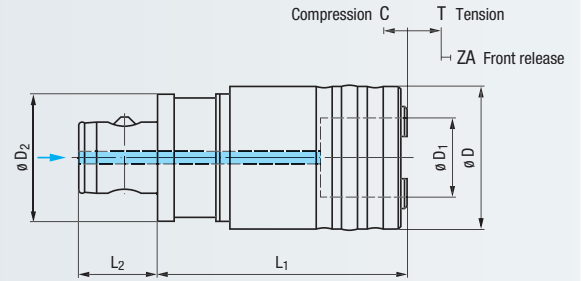
## KSN/HD

### ABS® Shank

ABS®-clutch (System KOMET)



For use on CNC machining centers and other machine tools



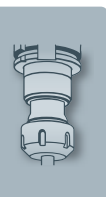
Type			Shank Size ø D <sub>2</sub>	mm							EDP Number	
				ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	C	T	ZA		
KSN 1/HD	M3 - M14 (No.0 - 9/16)	EM 01	ABS 32	40	19	69	23	5	7.5	2.5	F3101L01.1	★
KSN 3/HD	M4.5 - M24 (1/4 - 7/8)	EM 03	ABS 50	56	31	98	31	7	10	3	F3103L03.1	★

Further designs upon request

#### Accessories



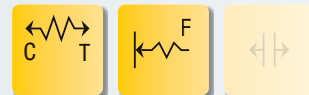
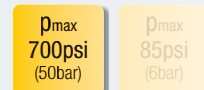
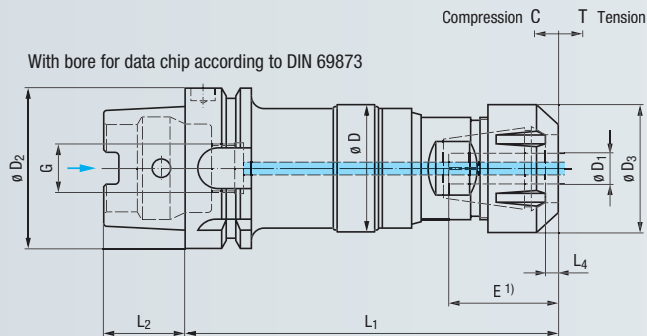
Quick-change adapters EM series, see page 391 - 409



# KSN/HD/ER

## HSK-A Shank

DIN 69893 A



For use on CNC machining centers and other machine tools

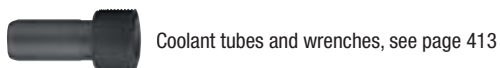
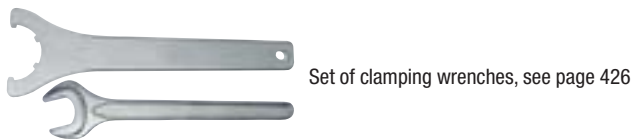
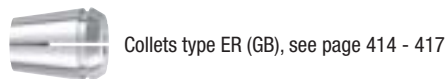
Type	Thread	$\varnothing D_1$	Collet Type	Material	Shank Size $\varnothing D_2$	mm							EDP Number	★	
						$\varnothing D$	$\varnothing D_3$	$L_1$	$L_2$	$L_4$	G	C			T
KSN 1/HD/ER	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERMC 20	HSK-A50	38	28	114	25	5	M16 x 1	5	7.5	F3231C03.1	★
					HSK-A63	38	28	116	32	5	M18 x 1	5	7.5	F3231C04.1	★
					HSK-A80	38	28	120	40	5	M20 x 1.5	5	7.5	F3231C05.1	★
					HSK-A100	38	28	121	50	5	M24 x 1.5	5	7.5	F3231C06.1	★
KSN 3/HD/ER	M4 - M20 (1/4 - 3/4)	4.5 - 16 mm 0.255 - 0.590	ER 32 (GB)	Hi-Q/ERC 32	HSK-A50	52	50	157	25	5	M16 x 1	7	10	F3233C03.1	★
					HSK-A63	52	50	147	32	5	M18 x 1	7	10	F3233C04.1	★
					HSK-A80	52	50	150	40	5	M20 x 1.5	7	10	F3233C05.1	★
					HSK-A100	52	50	152	50	5	M24 x 1.5	7	10	F3233C06.1	★

1) Clamping depth E, see page 428 - 429

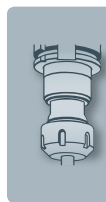
Further designs upon request

Clamping nut for sealing disks is included in the delivery

**Accessories**



- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

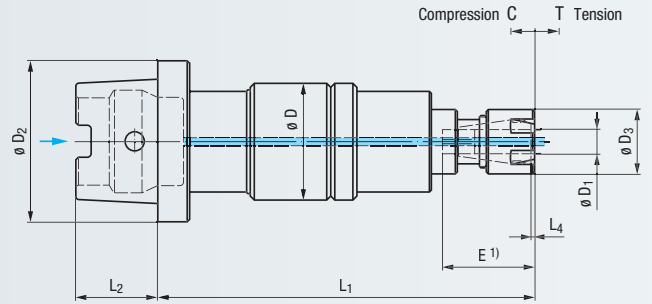
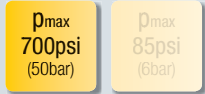


- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN/HD/ER

### HSK-C Shank

DIN 69893 C



For use on CNC machining centers and other machine tools

Type	Image	$\phi D_1$	Image	Image	Shank Size $\phi D_2$	mm								EDP Number	
						$\phi D$	$\phi D_3$	$L_1$ ER	$L_1$ ER-GB	$L_2$	$L_4$	C	T		
KSN 0/HD/ER		2.5 - 6 mm 0.141 - 0.194	ER 11 (GB)	Hi-Q/ERM 11	HSK-C32 HSK-C40	29	16	97.3	95.5	16	0.9	6	6	F3230K01.1	★
						29	16	97.3	95.5	20	0.9	6	6	F3230K02.1	★

<sup>1)</sup> Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut without integrated seal is included in the delivery

#### Accessories



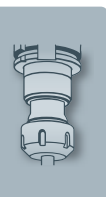
Collets type ER (GB), see page 414 - 416



Clamping nut with integrated seal, type Hi-Q/ERM 11, see page 422



Set of clamping wrenches, see page 426

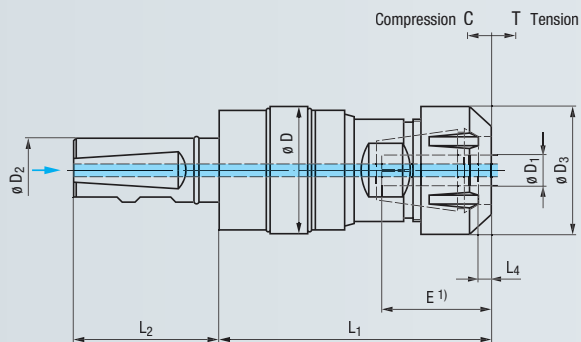




# KSN/HD/ER

## Cylindrical Shank

DIN 1835 B+E



For use on CNC machining centers and other machine tools

Type	Image	$\varnothing D_1$	Image	Image	Shank Size $\varnothing D_2$	mm						EDP Number	★	
						$\varnothing D$	$\varnothing D_3$	$L_1$	$L_2$	$L_4$	C			T
KSN 1/HD/ER	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERMC 20	25	38	28	85	57	5	5	7.5	F3231G26.1	★
KSN 3/HD/ER	M4 - M20 (1/4 - 3/4)	4.5 - 16 mm 0.255 - 0.590	ER 32 (GB)	Hi-Q/ERC 32	25	52	50	115	57	5	7	10	F3233G26.1	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

**Accessories**



Adapter shanks, see page 412



Collets type ER (GB), see page 414 - 417

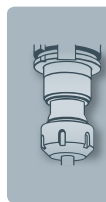


Sealing disks type DS/ER, see page 420



Set of clamping wrenches, see page 426

- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

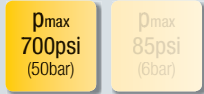
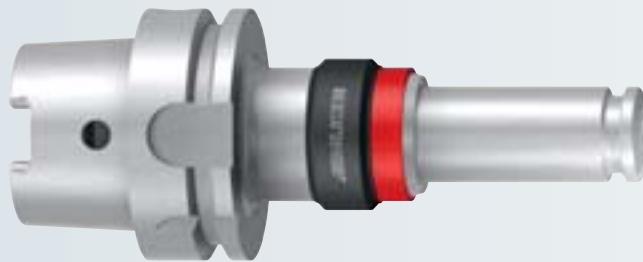


- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

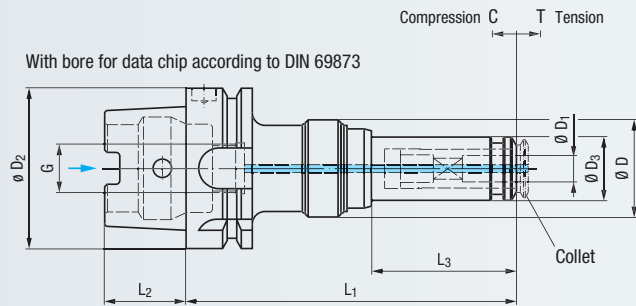
## KSN/HD/PGR

### HSK-A Shank

DIN 69893 A



For use on CNC machining centers and other machine tools



Type	Shank Size $\varnothing D_2$	$\varnothing D_1$	Shank Size $\varnothing D_2$	mm									EDP Number	★
				$\varnothing D$	$\varnothing D_3$	$L_1$	$L_2$	$L_3$	$G$	$C$	$T$			
KSN 1/HD/PGR	M4 - M12 (No.10 - 1/4)	4.5 - 10 mm 0.194 - 0.255	PGR 15 GB	HSK-A50	38	24	124	25	55	M16 x 1	5	7.5	F3241C03.1	★
				HSK-A63	38	24	126	32	55	M18 x 1	5	7.5	F3241C04.1	★
				HSK-A80	38	24	130	40	55	M20 x 1.5	5	7.5	F3241C05.1	★
				HSK-A100	38	24	131	50	55	M24 x 1.5	5	7.5	F3241C06.1	★
KSN 3/HD/PGR	M8 - M20 (1/4 - 3/4)	8 - 16 mm 0.255 - 0.590	PGR 25 GB	HSK-A50	52	40	170	25	66.5	M16 x 1	7	10	F3243C03.1	★
				HSK-A63	52	40	160	32	66.5	M18 x 1	7	10	F3243C04.1	★
				HSK-A80	52	40	163	40	66.5	M20 x 1.5	7	10	F3243C05.1	★
				HSK-A100	52	40	165	50	66.5	M24 x 1.5	7	10	F3243C06.1	★

Further designs upon request

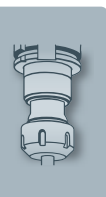
#### Accessories



Collets type PGR-GB, see page 434



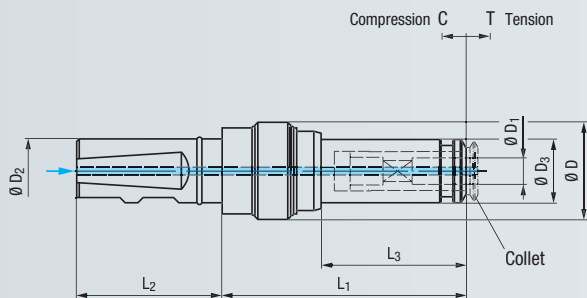
Coolant tubes and wrenches, see page 413



# KSN/HD/PGR

## Cylindrical Shank

DIN 1835 B+E



For use on CNC machining centers and other machine tools

Type	Image	$\varnothing D_1$	Image	Shank Size $\varnothing D_2$	mm							EDP Number	★
					$\varnothing D$	$\varnothing D_3$	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	C	T		
KSN 1/HD/PGR	M4 - M12 (No.10 - 1/4)	4.5 - 10 mm 0.194 - 0.255	PGR 15 GB	25	38	24	95	57	55	5	7.5	F3241G26.1	★
KSN 3/HD/PGR	M8 - M20 (1/4 - 3/4)	8 - 16 mm 0.255 - 0.590	PGR 25 GB	25	52	40	128	57	66.5	7	10	F3243G26.1	★

Further designs upon request

### Accessories

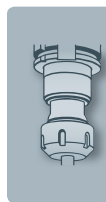


Adapter shanks, see page 412



Collets type PGR-GB, see page 434

- Product Finder
- Soft-synchro
- KSN**
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

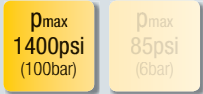


- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

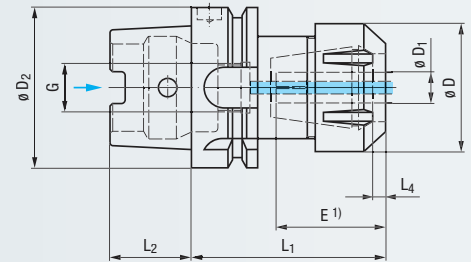
## KSN/Synchro

### HSK-A Shank

DIN 69893 A



With bore for data chip according to DIN 69873



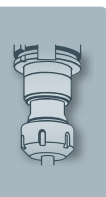
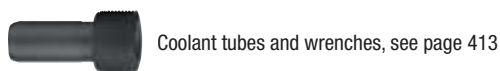
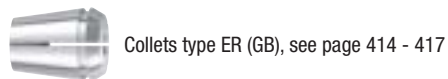
Type		$\varnothing D_1$			Shank Size $\varnothing D_2$	$\varnothing D$	$L_1$	$L_2$	$L_4$	G	EDP Number	
<b>KSN 1/ Synchro</b>	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERC 20	HSK-A50	34	68	25	5	M16 x 1	<b>F3131C03.1.30</b>	★
					HSK-A63	34	68	32	5	M18 x 1	<b>F3131C04.1.30</b>	★
					HSK-A100	34	74	50	5	M24 x 1.5	<b>F3131C06.1.30</b>	★
<b>KSN 3/ Synchro</b>	M4 - M20 (1/4 - 3/4)	4.5 - 16 mm 0.255 - 0.590	ER 32 (GB)	Hi-Q/ERC 32	HSK-A50	50	76	25	5	M16 x 1	<b>F3133C03.1.30</b>	★
					HSK-A63	50	76	32	5	M18 x 1	<b>F3133C04.1.30</b>	★
					HSK-A100	50	84	50	5	M24 x 1.5	<b>F3133C06.1.30</b>	★
<b>KSN 4/ Synchro</b>	M10 - M30 (1/4 - 1)	7 - 22 mm 0.255 - 0.800	ER 40 (GB)	Hi-Q/ERC 40	HSK-A63	63	80	32	5	M18 x 1	<b>F3134C04.1.30</b>	★
					HSK-A100	63	91	50	5	M24 x 1.5	<b>F3134C06.1.30</b>	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

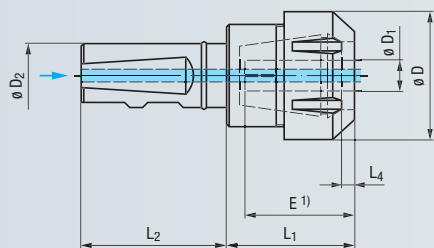
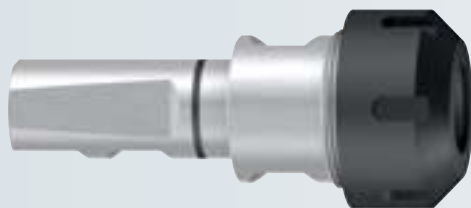
#### Accessories



# KSN/Synchro

## Cylindrical Shank

DIN 1835 B+E



- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

Type		$\varnothing D_1$			Shank Size $\varnothing D_2$	mm				EDP Number	
						$\varnothing D$	$L_1$	$L_2$	$L_4$		
<b>KSN 1/ Synchro</b>	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERC 20	25	34	42	57	5	<b>F3131G26.1.24</b>	★
<b>KSN 3/ Synchro</b>	M4 - M20 (1/4 - 3/4)	4.5 - 16 mm 0.255 - 0.590	ER 32 (GB)	Hi-Q/ERC 32	25	50	56	57	5	<b>F3133G26.1.24</b>	★
<b>KSN 4/ Synchro</b>	M10 - M30 (1/4 - 1)	7 - 22 mm 0.255 - 0.800	ER 40 (GB)	Hi-Q/ERC 40	25	63	65	57	5	<b>F3134G26.1.24</b>	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

**Accessories**



Adapter shanks, see page 412



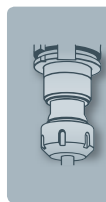
Collets type ER (GB), see page 414 - 417



Sealing disks type DS/ER, see page 420



Clamping wrench, see page 426

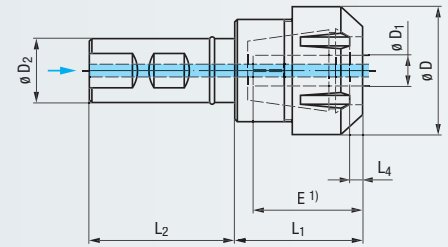
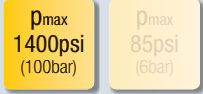
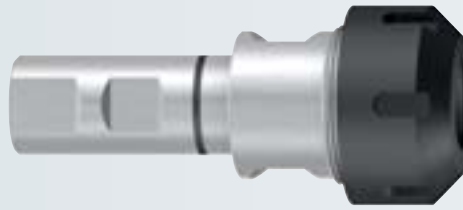


- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## KSN/Synchro

### Weldon Shank

ASME B94.19



Type	Shank Size $\varnothing D_2$	$\varnothing D_1$	$\varnothing D$	inch			EDP Number				
				$L_1$	$L_2$	$L_4$					
<b>KSN 1/ Synchro</b>	M4 - M12 (No. 8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERC 20	1	1.3386	1.6142	2.2835	0.1969	<b>F3131H36.1.24</b>	★
<b>KSN 3/ Synchro</b>	M4 - M20 (1/4 - 3/4)	4.5 - 16 mm 0.255 - 0.590	ER 32 (GB)	Hi-Q/ERC 32	1	1.9685	2.1654	2.2835	0.1969	<b>F3133H36.1.24</b>	★
<b>KSN 4/ Synchro</b>	M10 - M30 (1/4 - 1)	7 - 22 mm 0.255 - 0.800	ER 40 (GB)	Hi-Q/ERC 40	1	2.4803	2.5591	2.2835	0.1969	<b>F3134H36.1.24</b>	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

#### Accessories



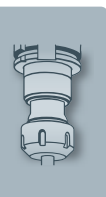
Collets type ER (GB), see page 414 - 417



Sealing disks type DS/ER, see page 420



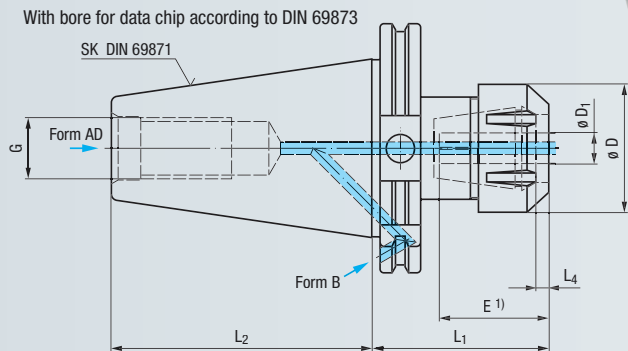
Clamping wrench, see page 426



# KSN/Synchro

## SK Shank

DIN 69871 AD, DIN 69871 B



- Product Finder
- Soft-synchro
- KSN**
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

Type		$\varnothing D_1$			Shank Size $\varnothing D_2$	$\varnothing D$	$L_1$	$L_2$	$L_4$	G	EDP Number	
<b>KSN 0/ Synchro</b>	M1 - M10 (No.0 - No.10)	2.5 - 7 mm 0.141 - 0.194	ER 11 (GB)	Hi-Q/ER 11	SK 40 AD	19	58	68.4	—	M16	F3130651.1	★
					SK 40 B	19	58	68.4	—	M16	F3130651.2	
					SK 50 AD	19	58	101.75	—	M24	F3130653.1	★
					SK 50 B	19	58	101.75	—	M24	F3130653.2	
<b>KSN 1/ Synchro</b>	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERC 20	SK 40 AD	34	68	68.4	5	M16	F3131651.1.24	★
					SK 40 B	34	68	68.4	5	M16	F3131651.2.24	★
					SK 50 AD	34	68	101.75	5	M24	F3131653.1.24	★
					SK 50 B	34	68	101.75	5	M24	F3131653.2.24	★
<b>KSN 3/ Synchro</b>	M4 - M20 (1/4 - 3/4)	4.5 - 16 mm 0.255 - 0.590	ER 32 (GB)	Hi-Q/ERC 32	SK 40 AD	50	76	68.4	5	M16	F3133651.1.24	★
					SK 40 B	50	76	68.4	5	M16	F3133651.2.24	★
					SK 50 AD	50	76	101.75	5	M24	F3133653.1.24	★
					SK 50 B	50	76	101.75	5	M24	F3133653.2.24	★
<b>KSN 4/ Synchro</b>	M10 - M30 (1/4 - 1)	7 - 22 mm 0.255 - 0.800	ER 40 (GB)	Hi-Q/ERC 40	SK 40 AD	63	85	68.4	5	M16	F3134651.1.24	★
					SK 40 B	63	85	68.4	5	M16	F3134651.2.24	★
					SK 50 AD	63	85	101.75	5	M24	F3134653.1.24	★
					SK 50 B	63	85	101.75	5	M24	F3134653.2.24	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

**KSN 0/Synchro**

Clamping nut without integrated seal is included in the delivery

**KSN 1-4/Synchro**

Clamping nut for sealing disks is included in the delivery

**Accessories**



Collets type ER (GB), see page 414 - 417



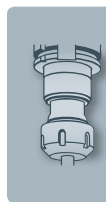
Sealing disks type DS/ER, see page 420



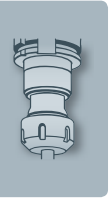
Clamping nut with integrated seal, type Hi-Q/ERC 11, see page 423



Clamping wrench, see page 426



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info







Product

Finder

Soft-

synchro

KSN

MQL

SFM

SWITCH-

MASTER

GRN-NC

SPEED-

SYNCHRO

HF

EM

Accessories

Tech. Info

## Softsynchro®/MMS and KSN/MQL Series

Application on machines with minimum-quantity lubrication (MQL)

Flow-optimized transfer of the MQL medium from machine spindle to threading tool.



- Product Finder
- Soft-synchro
- KSN
- MQL**
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## Softsynchro®/MMS

### HSK-A Shank

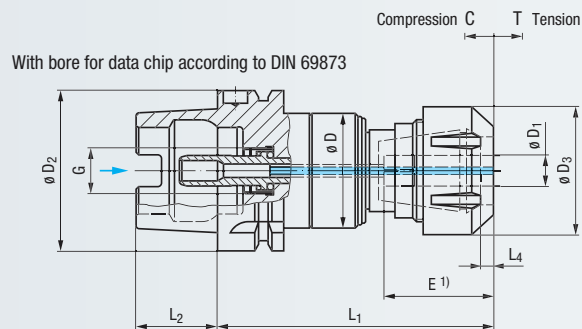
DIN 69893 A

Minimum-quantity lubrication – 1-channel MQL system



$p_{max}$   
700psi  
(50bar)

$p_{max}$   
85psi  
(6bar)



For use on machines with synchronous spindle

Type		$\phi D_1$			Shank Size $\phi D_2$	mm							EDP Number		
						$\phi D$	$\phi D_3$	$L_1$	$L_2$	$L_4$	G	C			T
Softsynchro® 1/MMS	M4.5 - M10	6 - 8 mm	ER 20 (GB)	Hi-Q/ERC 20	HSK-A50	34	34	93.5	25	5	M16 x 1	0.5	0.5	F3491C03.1.68	★
					HSK-A63	34	34	95.5	32	5	M18 x 1	0.5	0.5	F3491C04.1.68	★
					HSK-A100	34	34	102	50	5	M24 x 1.5	0.5	0.5	F3491C06.1.68	★
	M10 - M12	9 - 10 mm	ER 20 (GB)	Hi-Q/ERC 20	HSK-A50	34	34	93.5	25	5	M16 x 1	0.5	0.5	F3491C03.1	★
					HSK-A63	34	34	95.5	32	5	M18 x 1	0.5	0.5	F3491C04.1	★
					HSK-A100	34	34	102	50	5	M24 x 1.5	0.5	0.5	F3491C06.1	★
Softsynchro® 3/MMS	M10 - M20	9 - 16 mm	ER 32 (GB)	Hi-Q/ERC 32	HSK-A50	45	50	116.3	25	5	M16 x 1	0.5	0.5	F3493C03.1	★
					HSK-A63	45	50	108.8	32	5	M18 x 1	0.5	0.5	F3493C04.1	★
					HSK-A100	45	50	115.3	50	5	M24 x 1.5	0.5	0.5	F3493C06.1	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

The coolant tube is integrated into the shank and must not be disassembled, otherwise the function of the MQL transfer is no longer warranted!

MQL transfer suitable for E DIN 69090-4

MQL transfer is compatible with many company standards; however, it is necessary to check if the connection dimensions are suitable for the 1-channel MQL system used

Clamping nut for sealing disks is included in the delivery

#### Accessories



Collets type ER (GB), see page 414 - 417



Sealing disks type DS/ER, see page 420



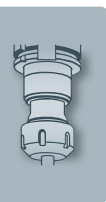
Set of clamping wrenches, see page 425



Assembly device, see page 425



Torque wrenches TORCO-FIX, see page 427

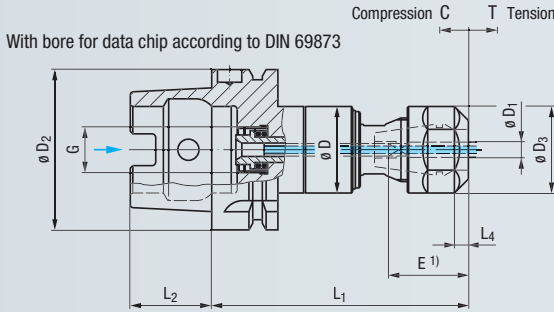
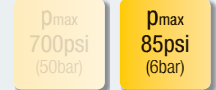


Minimum-quantity lubrication – 1-channel MQL system

**Softsynchro®/MMS**

**HSK-C Shank**

≈ DIN 69893 C 2)



For use on machines with synchronous spindle

Type	Image	ø D <sub>1</sub>	Image	Image	Shank Size ø D <sub>2</sub>	mm							EDP Number	★	
						ø D	ø D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>4</sub>	G	C			T
Softsynchro® 1/MMS	M4.5 - M10	6 - 8 mm	ER 20 (GB)	Hi-Q/ERC 20	HSK-C63	34	34	95.5	32	5	M18 x 1	0.5	0.5	F3491C04.1.526	★
	M10 - M12	9 - 10 mm			HSK-C63	34	34	95.5	32	5	M18 x 1	0.5	0.5	F3491C04.1.52	★

1) Clamping depth E, see page 428 - 429

2) Outside contour acc. DIN 69893 A, inside contour acc. DIN 69893 C

Further designs upon request

The coolant tube is integrated into the shank and must not be disassembled, otherwise the function of the MQL transfer is no longer warranted!

MQL transfer suitable for E DIN 69090-4

MQL transfer is compatible with many company standards; however, it is necessary to check if the connection dimensions are suitable for the 1-channel MQL system used

Clamping nut for sealing disks is included in the delivery

Accessories



Collets type ER (GB), see page 414 - 416



Sealing disks type DS/ER, see page 420



Set of clamping wrenches, see page 425



Assembly device, see page 425



Torque wrenches TORCO-FIX, see page 427



- Product Finder
- Soft-synchro
- KSN
- MLQ**
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## Softsynchro®/MMS

### HSK-A Shank

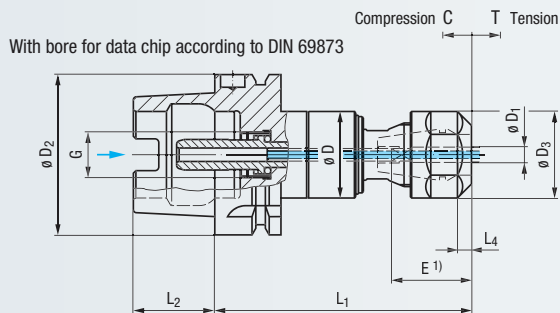
DIN 69893 A

Minimum-quantity lubrication – 2-channel MQL system



$p_{max}$   
700psi  
(50bar)

$p_{max}$   
85psi  
(6bar)



For use on machines with synchronous spindle

Type		$\varnothing D_1$			Shank Size $\varnothing D_2$	mm							EDP Number		
						$\varnothing D$	$\varnothing D_3$	$L_1$	$L_2$	$L_4$	G	C			T
Softsynchro® 1/MMS	M4.5 - M12	6 - 10 mm	ER 20 (GB)	Hi-Q/ERC 20	HSK-A50	34	34	93.5	25	5	M16 x 1	0.5	0.5	<b>F3511C03.1</b>	★
					HSK-A63	34	34	95.5	32	5	M18 x 1	0.5	0.5	<b>F3511C04.1</b>	★
					HSK-A100	34	34	102	50	5	M24 x 1.5	0.5	0.5	<b>F3511C06.1</b>	★

<sup>1)</sup> Clamping depth E, see page 428 - 429

Further designs upon request

The coolant tube is integrated into the shank and must not be disassembled, otherwise the function of the MQL transfer is no longer warranted!

MQL transfer is compatible with many company standards; however, it is necessary to check if the connection dimensions are suitable for the 2-channel MQL system used

Clamping nut for sealing disks is included in the delivery

#### Accessories



Collets type ER (GB), see page 414 - 416



Sealing disks type DS/ER, see page 420



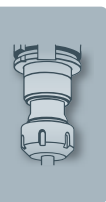
Set of clamping wrenches, see page 425



Assembly device, see page 425

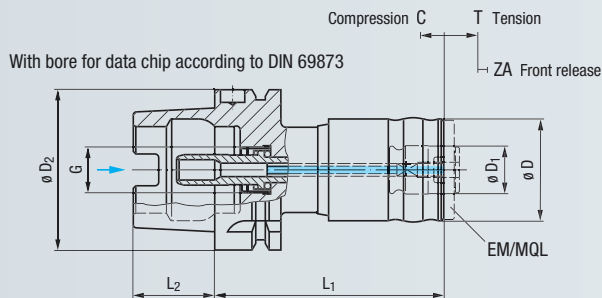
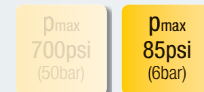


Torque wrenches TORCO-FIX, see page 427



Minimum-quantity lubrication – 1-channel MQL system

**KSN/MQL**  
**HSK-A Shank**  
 DIN 69893 A



For use on CNC machining centers and other machine tools

Type	Tap	Shank Size $\varnothing D_2$	mm									EDP Number	★
			$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	G	C	T	ZA			
KSN 1/MQL	M6 - M12	EM 01/MQL	HSK-A40	40	19	88	20	M12 x 1	5	5	2.5	F3471C02.1	★
			HSK-A50	40	19	90	25	M16 x 1	5	5	2.5	F3471C03.1	★
			HSK-A63	40	19	90	32	M18 x 1	5	5	2.5	F3471C04.1	★
			HSK-A80	40	19	93	40	M20 x 1.5	5	5	2.5	F3471C05.1	★
			HSK-A100	40	19	93	50	M24 x 1.5	5	5	2.5	F3471C06.1	★
KSN 3/MQL	M10 - M24	EM 03/MQL	HSK-A63	56	31	120	32	M18 x 1	7	7	3	F3473C04.1	★
			HSK-A80	56	31	125	40	M20 x 1.5	7	7	3	F3473C05.1	★
			HSK-A100	56	31	128	50	M24 x 1.5	7	7	3	F3473C06.1	★

Further designs upon request

The coolant tube is integrated into the shank and must not be disassembled, otherwise the function of the MQL transfer is no longer warranted!

MQL transfer suitable for E DIN 69090-4

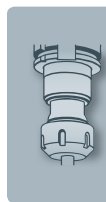
MQL transfer is compatible with many company standards; however, it is necessary to check if the connection dimensions are suitable for the 1-channel MQL system used

Accessories



Quick-change adapters type EM/MQL, see page 366

- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



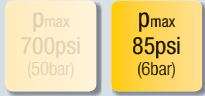
- Product Finder
- Soft-synchro
- KSN
- MQL**
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

# KSN/MQL

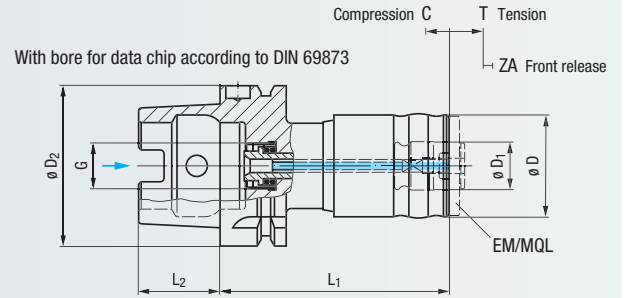
## HSK-C Shank

≈ DIN 69893 C 1)

Minimum-quantity lubrication – 1-channel MQL system



For use on CNC machining centers and other machine tools



Type	Tap	Shank Size $\varnothing D_2$	mm									EDP Number	★
			$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	G	C	T	ZA			
KSN 1/MQL	M6 - M12	EM 01/MQL	HSK-C40	40	19	88	20	M12 x 1	5	5	2.5	F3471C02.1.52	★
			HSK-C50	40	19	90	25	M16 x 1	5	5	2.5	F3471C03.1.52	★
			HSK-C63	40	19	90	32	M18 x 1	5	5	2.5	F3471C04.1.52	★
KSN 3/MQL	M10 - M24	EM 03/MQL	HSK-C63	56	31	120	32	M18 x 1	7	7	3	F3473C04.1.52	★
			HSK-C80	56	31	125	40	M20 x 1.5	7	7	3	F3473C05.1.52	★
			HSK-C100	56	31	128	50	M24 x 1.5	7	7	3	F3473C06.1.52	★

1) Outside contour acc. DIN 69893 A, inside contour acc. DIN 69893 C

Further designs upon request

The coolant tube is integrated into the shank and must not be disassembled, otherwise the function of the MQL transfer is no longer warranted!

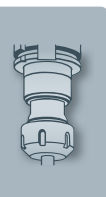
MQL transfer suitable for E DIN 69090-4

MQL transfer is compatible with many company standards; however, it is necessary to check if the connection dimensions are suitable for the 1-channel MQL system used

### Accessories



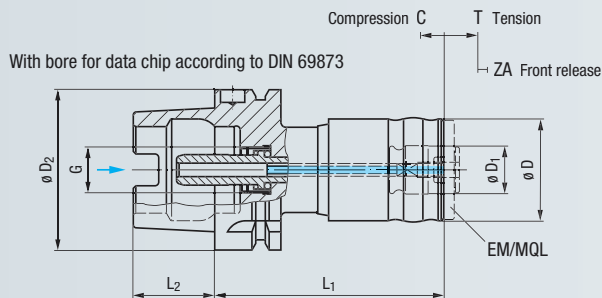
Quick-change adapters type EM/MQL, see page 366



Minimum-quantity lubrication – 2-channel MQL system



**KSN/MQL**  
**HSK-A Shank**  
DIN 69893 A



For use on CNC machining centers and other machine tools

Type	M6 - M12	EM 01/MQL	Shank Size $\varnothing D_2$	mm								EDP Number	★
				$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	G	C	T	ZA		
KSN 1/MQL			HSK-A40	40	19	88	20	M12 x 1	5	5	2.5	F3481C02.1	★
			HSK-A50	40	19	90	25	M16 x 1	5	5	2.5	F3481C03.1	★
			HSK-A63	40	19	90	32	M18 x 1	5	5	2.5	F3481C04.1	★
			HSK-A80	40	19	93	40	M20 x 1.5	5	5	2.5	F3481C05.1	★
			HSK-A100	40	19	93	50	M24 x 1.5	5	5	2.5	F3481C06.1	★

Further designs upon request

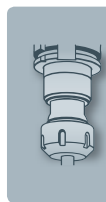
The coolant tube is integrated into the shank and must not be disassembled, otherwise the function of the MQL transfer is no longer warranted!

MQL transfer is compatible with many company standards; however, it is necessary to check if the connection dimensions are suitable for the 2-channel MQL system used

Accessories



Quick-change adapters type EM/MQL, see page 366

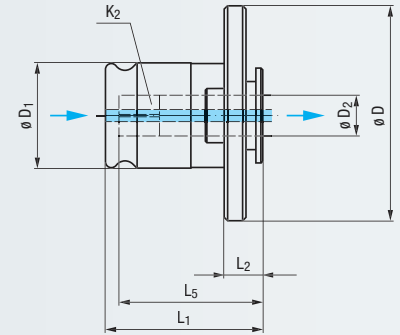


- Product Finder
- Soft-synchro
- KSN
- ML**
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## EM/MQL

### Metric

#### DIN



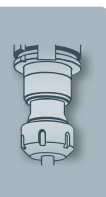
$p_{max}$   
700psi  
(50bar)

$p_{max}$   
85psi  
(6bar)

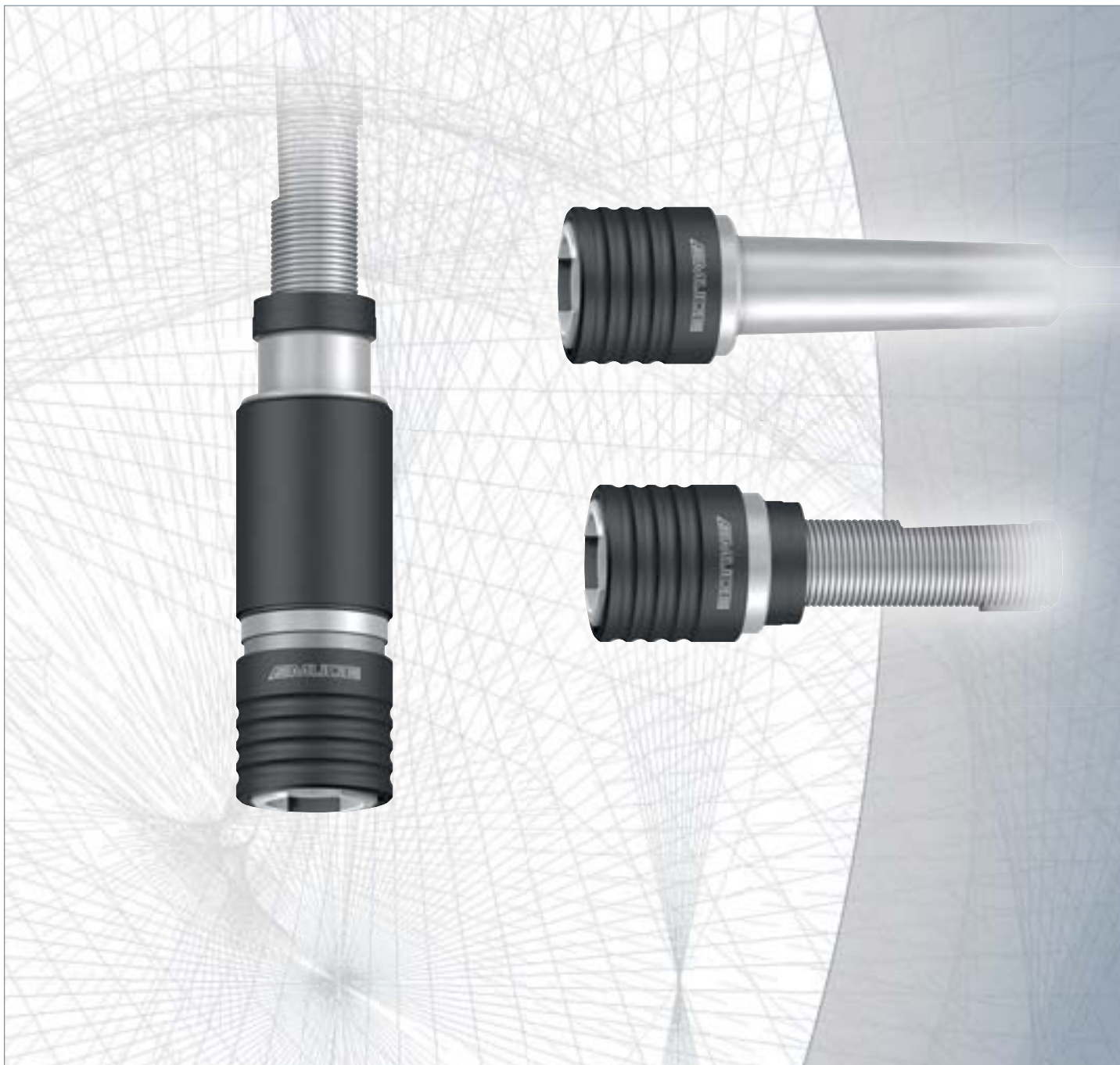
Type		EM01/MQL		EM03/MQL							
		M6 - M12		M10 - M24							
<b>Quick-Change Adapter Dimensions (mm)</b>		$\varnothing D$		$\varnothing D_1$		$L_1$		$L_2$			
		39		55		29		7.5			
		19		31		45		10			
		29		45							
		7.5		10							
mm				EDP Number		L <sub>5</sub>		EDP Number		L <sub>5</sub>	
$\varnothing D_2$	K <sub>2</sub>										
6	4.9	M6	M8	<b>F4491106.6</b>	25	★					
7	5.5	M7	M9 - M10	<b>F4491107.6</b>	25	★					
8	6.2	M8	M11	<b>F4491108.6</b>	26	★					
9	7	M9	M12	<b>F4491109.6</b>	27	★					
10	8	M10		<b>F4491110.6</b>	27	★	<b>F4493110.6</b>	40	★		
11	9		M14				<b>F4493111.6</b>	41	★		
12	9		M16				<b>F4493112.6</b>	41	★		
14	11		M18				<b>F4493113.6</b>	43	★		
16	12		M20				<b>F4493114.6</b>	44	★		
18	14.5		M22 - M24				<b>F4493115.6</b>	44	★		

1) If used with taps / roll form taps with internal coolant supply

Only suitable for quick-change tap holders type KSN/MQL





Product  
FinderSoft-  
synchro

KSN

MQL

SFM

SWITCH-  
MASTER

GRN-NC

SPEED-  
SYNCHRO

HF

EM

Accessories

Tech. Info

## SFM Series

**Application on multi-spindle machines and transfer lines**

Especially suitable, too, for multi-spindle heads due to their slim design.

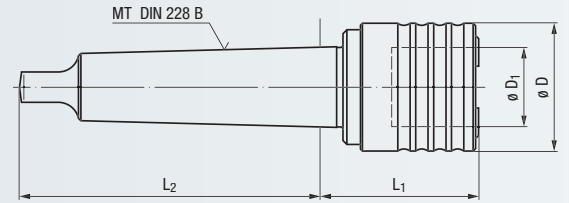
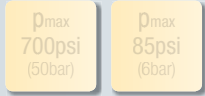


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM**
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## SFM

### Morse Taper Shank

DIN 228 B (ASME B5.10)



For use on multi-spindle machines and transfer lines

Type	Shank Size	inch				EDP Number			
		ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>				
SFM 00	M1 - M10 (No.0 - 1/4)	EM 00	MT 1	0.9055	0.5118	1.5354	2.4409	F0100101	★
			MT 2	0.9055	0.5118	1.5748	2.9528	F0100102	★
SFM 01	M3 - M14 (No.0 - 9/16)	EM 01	MT 1	1.2598	0.7480	1.6929	2.4409	F0101101	★
			MT 2	1.2598	0.7480	1.7323	2.9528	F0101102	★
			MT 3	1.2598	0.7480	1.7323	3.7008	F0101103	★
SFM 03	M4.5 - M24 (1/4 - 7/8)	EM 03	MT 2	1.9685	1.2205	2.4016	2.9528	F0103102	★
			MT 3	1.9685	1.2205	2.4016	3.7008	F0103103	★
			MT 4	1.9685	1.2205	2.4409	4.6260	F0103104	★
SFM 04	M14 - M36 (5/8 - 1 3/8)	EM 04	MT 3	2.8346	1.8898	3.5433	3.7008	F0104103	★
			MT 4	2.8346	1.8898	3.5827	4.6260	F0104104	★
			MT 5	2.8346	1.8898	3.7402	5.8858	F0104105	★

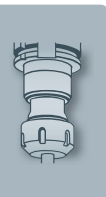
Morse taper shank with clamping thread acc. DIN 228 A upon request

Further designs upon request

#### Accessories



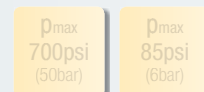
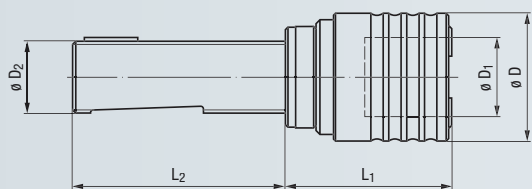
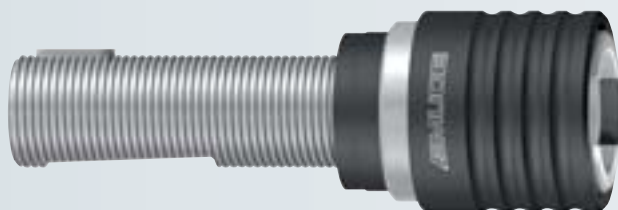
Quick-change adapters EM series, see page 391 - 409



# SFM

## Trapezoidal Shank

DIN 6327



For use on multi-spindle machines and transfer lines

Type	Image	Image	Shank Size $\varnothing D_2$	mm				EDP Number	★
				$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$		
SFM 00	M1 - M10 (No.0 - 1/4)	EM 00	Tr 16 x 1.5	23	13	45	73	F0100213	★
			Tr 20 x 2	23	13	45	76	F0100214	
SFM 01	M3 - M14 (No.0 - 9/16)	EM 01	Tr 16 x 1.5	32	19	49	73	F0101213	★
			Tr 20 x 2	32	19	49	76	F0101214	★
			Tr 28 x 2	32	19	49	83	F0101216	★
SFM 03	M4.5 - M24 (1/4 - 7/8)	EM 03	Tr 20 x 2	50	31	66	76	F0103214	★
			Tr 28 x 2	50	31	66	83	F0103216	★
			Tr 36 x 2	50	31	68	104	F0103218	★
SFM 04	M14 - M36 (5/8 - 1 3/8)	EM 04	Tr 28 x 2	72	48	95	83	F0104216	
			Tr 36 x 2	72	48	97	104	F0104218	★
			Tr 48 x 2	72	48	101	126	F0104219	

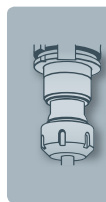
Further designs upon request

Accessories



Quick-change adapters EM series, see page 391 - 409

- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM**
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

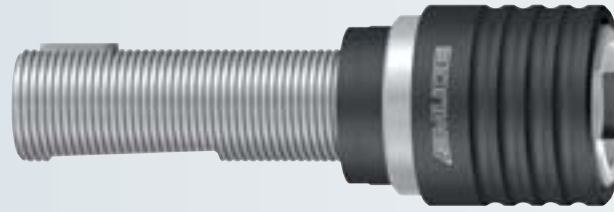


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM**
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## SFM

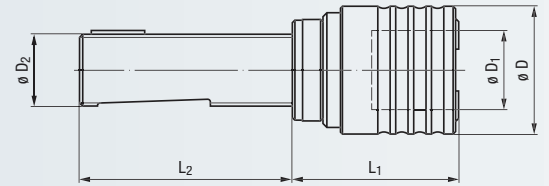
### ACME Shank

ASME B5.11



$p_{max}$   
700psi  
(50bar)

$p_{max}$   
85psi  
(6bar)



For use on multi-spindle machines and transfer lines

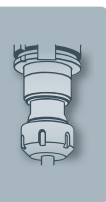
Type	Shank Size ø D <sub>2</sub> ACME	EM	inch				EDP Number	★	
			ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>			
SFM 00	M1 - M10 (No.0 - 1/4)	EM 00	5/8 x 16	0.9055	0.5118	1.7126	2.5787	F0100271	★
	3/4 x 12		0.9055	0.5118	1.7126	2.5787	F0100272	★	
SFM 01	M3 - M14 (No.0 - 9/16)	EM 01	5/8 x 16	1.2598	0.7480	1.8701	2.5787	F0101271	★
			3/4 x 12	1.2598	0.7480	1.8701	2.5787	F0101272	★
			1 1/16 x 12	1.2598	0.7480	1.8307	3.2087	F0101275	★
SFM 03	M4.5 - M24 (1/4 - 7/8)	EM 03	1 1/16 x 12	1.9685	1.2205	2.5394	3.2087	F0103275	★
			1 3/8 x 12	1.9685	1.2205	2.4213	4.2126	F0103276	★
SFM 04	M14 - M36 (5/8 - 1 3/8)	EM 04	1 3/8 x 12	2.8346	1.8898	3.6811	4.2126	F0104276	★
			1 7/8 x 12	2.8346	1.8898	3.6811	5.2165	F0104277	★

Further designs upon request

#### Accessories



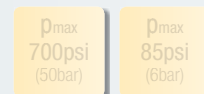
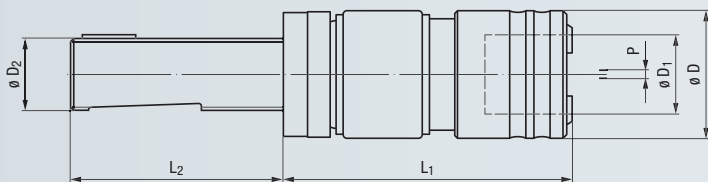
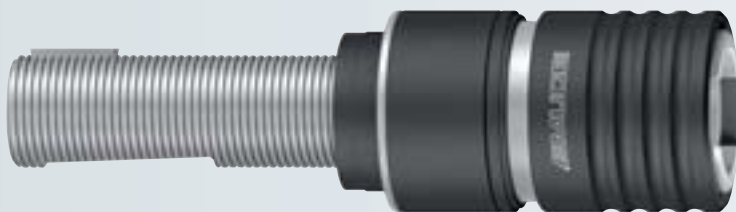
Quick-change adapters EM series, see page 391 - 409



# SFM-NP

## Trapezoidal Shank

DIN 6327



For use on multi-spindle machines and transfer lines

Type	Shank Size ø D <sub>2</sub>	EM	mm						EDP Number	
			ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	P			
SFM 00-NP	M1 - M10 (No.0 - 1/4)	EM 00	Tr 16 x 1.5	23	13	65	73	0.8	F2110213	upon request
			Tr 20 x 2	23	13	65	76	0.8	F2110214	
SFM 01-NP	M3 - M14 (No.0 - 9/16)	EM 01	Tr 16 x 1.5	32	19	70	73	1.4	F2111213	upon request
			Tr 20 x 2	32	19	70	76	1.4	F2111214	
			Tr 28 x 2	32	19	70	83	1.4	F2111216	
SFM 03-NP	M4.5 - M24 (1/4 - 7/8)	EM 03	Tr 20 x 2	50	31	96	76	2.5	F2113214	upon request
			Tr 28 x 2	50	31	96	83	2.5	F2113216	
			Tr 36 x 2	50	31	98	104	2.5	F2113218	

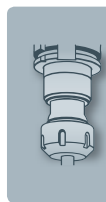
Further designs upon request

**Accessories**



Quick-change adapters EM series, see page 391 - 409

- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM**
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

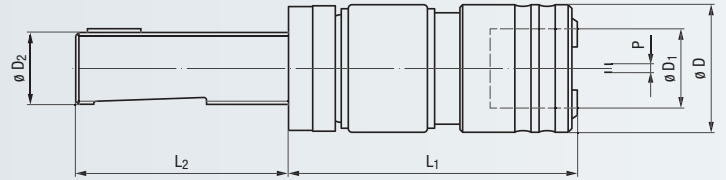
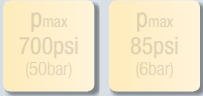
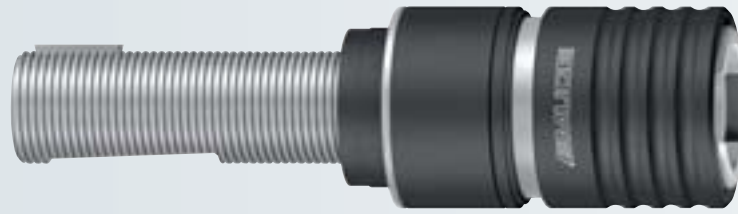


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM**
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## SFM-NP

### ACME Shank

ASME B5.11



For use on multi-spindle machines and transfer lines

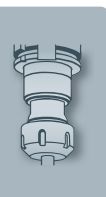
Type	Shank Size $\varnothing D_2$ ACME	inch	$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	P	EDP Number		
SFM 00-NP	M1 - M10 (No.0 - 1/4)	EM 00	5/8 x 16	0.9055	0.5118	2.5000	2.5787	0.0315	<b>F2110M33</b>	upon request
			3/4 x 12	0.9055	0.5118	2.5000	2.5787	0.0315	<b>F2110M34</b>	
SFM 01-NP	M3 - M14 (No.0 - 9/16)	EM 01	3/4 x 12	1.2598	0.7480	2.6969	2.5787	0.0551	<b>F2111M34</b>	upon request
			1 1/16 x 12	1.2598	0.7480	2.6969	3.2087	0.0551	<b>F2111M37</b>	
SFM 03-NP	M4.5 - M24 (1/4 - 7/8)	EM 03	1 1/16 x 12	1.9685	1.2205	3.7205	3.2087	0.0984	<b>F2113M37</b>	upon request
			1 3/8 x 12	1.9685	1.2205	3.7205	4.2126	0.0984	<b>F2113M39</b>	

Further designs upon request

#### Accessories



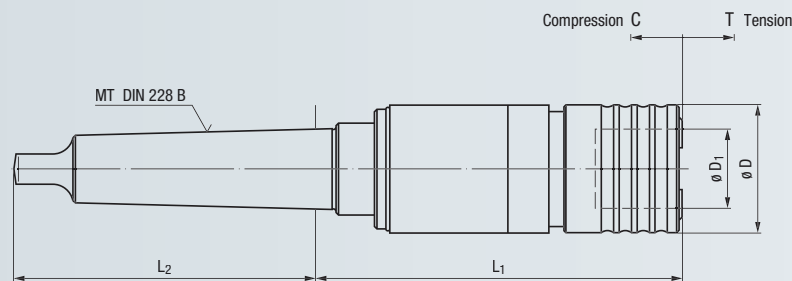
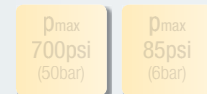
Quick-change adapters EM series, see page 391 - 409



# SFM-L-DZ

## Morse Taper Shank

DIN 228 B (ASME B5.10)



For use on multi-spindle machines and transfer lines

Type			Shank Size	$\phi D$	$\phi D_1$	$L_1$	$L_2$	C	T	inch	EDP Number			
SFM 00-L20-DZ	M1 - M10 (No.0 - 1/4)	EM 00	MT 1	0.9055	0.5118	3.5433	2.4409	0.3937	0.3937		F0180101.7	★		
			MT 2	0.9055	0.5118	3.5827	2.9528	0.3937	0.3937		F0180102.7	★		
MT 1			0.9055	0.5118	4.1339	2.4409	0.5906	0.5906		F0190101.7	★			
MT 2			0.9055	0.5118	4.1732	2.9528	0.5906	0.5906		F0190102.7	★			
SFM 01-L20-DZ	M3 - M14 (No.0 - 9/16)	EM 01	MT 1	1.2598	0.7480	4.0157	2.4409	0.3937	0.3937		F0181101.7	★		
			MT 2	1.2598	0.7480	4.0551	2.9528	0.3937	0.3937		F0181102.7	★		
			MT 3	1.2598	0.7480	4.0551	3.7008	0.3937	0.3937		F0181103.7	★		
MT 1			1.2598	0.7480	4.6063	2.4409	0.5906	0.5906		F0191101.7	★			
MT 2			1.2598	0.7480	4.6457	2.9528	0.5906	0.5906		F0191102.7	★			
MT 3			1.2598	0.7480	4.6457	3.7008	0.5906	0.5906		F0191103.7	★			
SFM 01-L40-DZ			M4.5 - M24 (1/4 - 7/8)	EM 03	MT 1	1.2598	0.7480	5.1969	2.4409	0.7874	0.7874		F0201101.7	★
					MT 2	1.2598	0.7480	5.2362	2.9528	0.7874	0.7874		F0201102.7	★
					MT 3	1.2598	0.7480	5.2362	3.7008	0.7874	0.7874		F0201103.7	★
MT 2	1.9685	1.2205			5.5906	2.9528	0.5906	0.5906		F0183102.7	★			
SFM 03-L30-DZ	M4.5 - M24 (1/4 - 7/8)	EM 03			MT 3	1.9685	1.2205	5.5906	3.7008	0.5906	0.5906		F0183103.7	★
					MT 4	1.9685	1.2205	5.6299	4.6260	0.5906	0.5906		F0183104.7	★
			MT 2	1.9685	1.2205	6.1811	2.9528	0.7874	0.7874		F0193102.7	★		
SFM 03-L40-DZ			M4.5 - M24 (1/4 - 7/8)	EM 03	MT 3	1.9685	1.2205	6.1811	3.7008	0.7874	0.7874		F0193103.7	★
					MT 4	1.9685	1.2205	6.2205	4.6260	0.7874	0.7874		F0193104.7	★
					MT 3	2.8346	1.8898	7.4016	3.7008	0.5906	0.5906		F0184103.7	★
SFM 04-L30-DZ	M14 - M36 (5/8 - 1 3/8)	EM 04			MT 4	2.8346	1.8898	7.4409	4.6260	0.5906	0.5906		F0184104.7	★
					MT 5	2.8346	1.8898	7.4803	5.8858	0.5906	0.5906		F0184105.7	★
					MT 3	2.8346	1.8898	7.9921	3.7008	0.7874	0.7874		F0194103.7	★
SFM 04-L40-DZ			M14 - M36 (5/8 - 1 3/8)	EM 04	MT 4	2.8346	1.8898	8.0315	4.6260	0.7874	0.7874		F0194104.7	★
					MT 5	2.8346	1.8898	8.0709	5.8858	0.7874	0.7874		F0194105.7	★

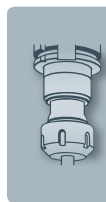
Morse taper shank with clamping thread acc. DIN 228 A upon request

Further designs upon request

Accessories



Quick-change adapters EM series, see page 391 - 409



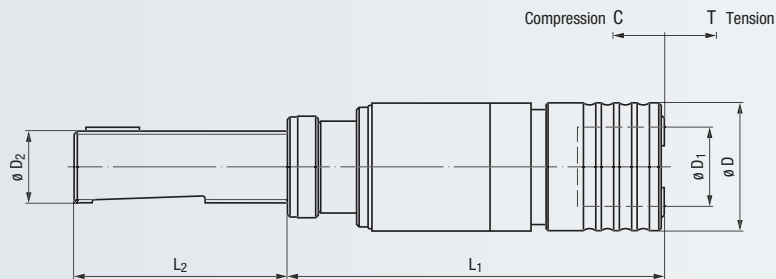
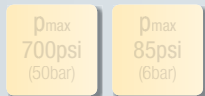
## SFM-L-DZ

### Trapezoidal Shank

DIN 6327



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM**
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



For use on multi-spindle machines and transfer lines

Type	Shank Size ø D <sub>2</sub>	EM	mm							EDP Number	★
			ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	C	T			
SFM 00-L20-DZ	M1 - M10 (No.0 - 1/4)	EM 00	Tr 16 x 1.5	23	13	96	73	10	10	F0180213.7	★
			Tr 20 x 2	23	13	96	76	10	10	F0180214.7	★
SFM 00-L30-DZ	M1 - M10 (No.0 - 1/4)	EM 00	Tr 16 x 1.5	23	13	111	73	15	15	F0190213.7	★
			Tr 20 x 2	23	13	111	76	15	15	F0190214.7	★
SFM 01-L20-DZ	M3 - M14 (No.0 - 9/16)	EM 01	Tr 16 x 1.5	32	19	108	73	10	10	F0181213.7	★
			Tr 20 x 2	32	19	108	76	10	10	F0181214.7	★
			Tr 28 x 2	32	19	108	83	10	10	F0181216.7	★
SFM 01-L30-DZ	M3 - M14 (No.0 - 9/16)	EM 01	Tr 16 x 1.5	32	19	123	73	15	15	F0191213.7	★
			Tr 20 x 2	32	19	123	76	15	15	F0191214.7	★
			Tr 28 x 2	32	19	123	83	15	15	F0191216.7	★
SFM 01-L40-DZ	M3 - M14 (No.0 - 9/16)	EM 01	Tr 16 x 1.5	32	19	138	73	20	20	F0201213.7	★
			Tr 20 x 2	32	19	138	76	20	20	F0201214.7	★
			Tr 28 x 2	32	19	138	83	20	20	F0201216.7	★
SFM 03-L30-DZ	M4.5 - M24 (1/4 - 7/8)	EM 03	Tr 20 x 2	50	31	147	76	15	15	F0183214.7	★
			Tr 28 x 2	50	31	147	83	15	15	F0183216.7	★
			Tr 36 x 2	50	31	149	104	15	15	F0183218.7	★
SFM 03-L40-DZ	M4.5 - M24 (1/4 - 7/8)	EM 03	Tr 20 x 2	50	31	162	76	20	20	F0193214.7	★
			Tr 28 x 2	50	31	162	83	20	20	F0193216.7	★
			Tr 36 x 2	50	31	164	104	20	20	F0193218.7	★
SFM 04-L30-DZ	M14 - M36 (5/8 - 1 3/8)	EM 04	Tr 28 x 2	72	48	193	83	15	15	F0184216.7	★
			Tr 36 x 2	72	48	195	104	15	15	F0184218.7	★
			Tr 48 x 2	72	48	199	126	15	15	F0184219.7	★
SFM 04-L40-DZ	M14 - M36 (5/8 - 1 3/8)	EM 04	Tr 28 x 2	72	48	208	83	20	20	F0194216.7	★
			Tr 36 x 2	72	48	210	104	20	20	F0194218.7	★
			Tr 48 x 2	72	48	214	126	20	20	F0194219.7	★

Further designs upon request

#### Accessories



Quick-change adapters EM series, see page 391 - 409

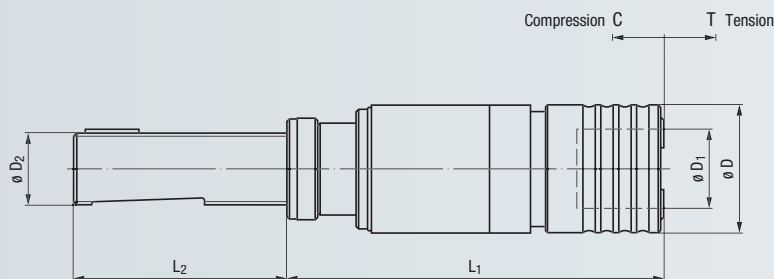
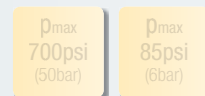
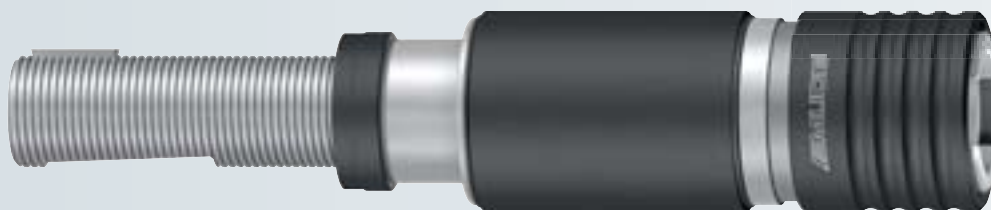


# SFM-L-DZ

## ACME Shank

ASME B5.11

- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



For use on multi-spindle machines and transfer lines

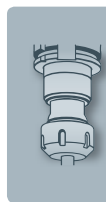
Type	Shank Thread	EM Series	Shank Size ø D <sub>2</sub> ACME	inch						EDP Number	★
				ø D	ø D <sub>1</sub>	L <sub>1</sub>	L <sub>2</sub>	C	T		
SFM 00-L20-DZ	M1 - M10 (No.0 - 1/4)	EM 00	5/8 x 16	0.9055	0.5118	3.7205	2.5787	0.3937	0.3937	F0180271.7	★
			3/4 x 12	0.9055	0.5118	3.7205	2.5787	0.3937	0.3937	F0180272.7	★
SFM 00-L30-DZ	M1 - M10 (No.0 - 1/4)	EM 00	5/8 x 16	0.9055	0.5118	4.3110	2.5787	0.5906	0.5906	F0190271.7	★
			3/4 x 12	0.9055	0.5118	4.3110	2.5787	0.5906	0.5906	F0190272.7	★
SFM 01-L20-DZ	M3 - M14 (No.0 - 9/16)	EM 01	5/8 x 16	1.2598	0.7480	4.1929	2.5787	0.5906	0.5906	F0181271.7	★
			3/4 x 12	1.2598	0.7480	4.1929	2.5787	0.5906	0.5906	F0181272.7	★
SFM 01-L30-DZ	M3 - M14 (No.0 - 9/16)	EM 01	1 1/16 x 12	1.2598	0.7480	4.1929	3.2087	0.5906	0.5906	F0181275.7	★
			5/8 x 16	1.2598	0.7480	4.7835	2.5787	0.7874	0.7874	F0191271.7	★
			3/4 x 12	1.2598	0.7480	4.7835	2.5787	0.7874	0.7874	F0191272.7	★
SFM 03-L30-DZ	M4.5 - M24 (1/4 - 7/8)	EM 03	3/4 x 12	1.9685	1.2205	5.7283	2.5787	0.5906	0.5906	F0183272.7	★
			1 1/16 x 12	1.9685	1.2205	5.7283	3.2087	0.5906	0.5906	F0183275.7	★
SFM 03-L40-DZ	M4.5 - M24 (1/4 - 7/8)	EM 03	1 3/8 x 12	1.9685	1.2205	5.7283	4.2126	0.5906	0.5906	F0183276.7	★
			3/4 x 12	1.9685	1.2205	6.3189	2.5787	0.7874	0.7874	F0193272.7	★
			1 1/16 x 12	1.9685	1.2205	6.3189	3.2087	0.7874	0.7874	F0193275.7	★
SFM 04-L30-DZ	M14 - M36 (5/8 - 1 3/8)	EM 04	1 3/8 x 12	1.9685	1.2205	6.3189	4.2126	0.7874	0.7874	F0193276.7	★
			1 1/16 x 12	2.8346	1.8898	7.5394	3.2087	0.5906	0.5906	F0184275.7	★
SFM 04-L40-DZ	M14 - M36 (5/8 - 1 3/8)	EM 04	1 3/8 x 12	2.8346	1.8898	7.5394	4.2126	0.5906	0.5906	F0184276.7	★
			1 7/8 x 12	2.8346	1.8898	7.5394	5.2165	0.5906	0.5906	F0184277.7	★
			1 1/16 x 12	2.8346	1.8898	8.1299	3.2087	0.7874	0.7874	F0194275.7	★
SFM 04-L40-DZ	M14 - M36 (5/8 - 1 3/8)	EM 04	1 3/8 x 12	2.8346	1.8898	8.1299	4.2126	0.7874	0.7874	F0194276.7	★
			1 7/8 x 12	2.8346	1.8898	8.1299	5.2165	0.7874	0.7874	F0194277.7	★

Further designs upon request

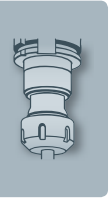
Accessories



Quick-change adapters EM series, see page 391 - 409



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info





Product

Finder

Soft-

synchro

KSN

MQL

SFM

SWITCH-

MASTER

GRN-NC

SPEED-

SYNCHRO

HF

EM

Accessories

Tech. Info

## SWITCH-MASTER®, GRN-NC and SPEEDSYNCHRO® Series

**Application on CNC machining centers and special machines with and without synchronous spindle**

**SWITCH-MASTER® and GRN-NC:**

No change of rotating direction of machine spindle at reverse stroke required due to integrated reverse gear. Especially for the SWITCH-MASTER® considerable saving of time due to patent-protected switch mechanism by compressed air.

**SPEEDSYNCHRO®:**

The collet holder SPEEDSYNCHRO® is equipped with an integrated transmission with a transmission ratio of 1:4.412, which it combines with the highly successful Softsynchro® minimum-length compensation.

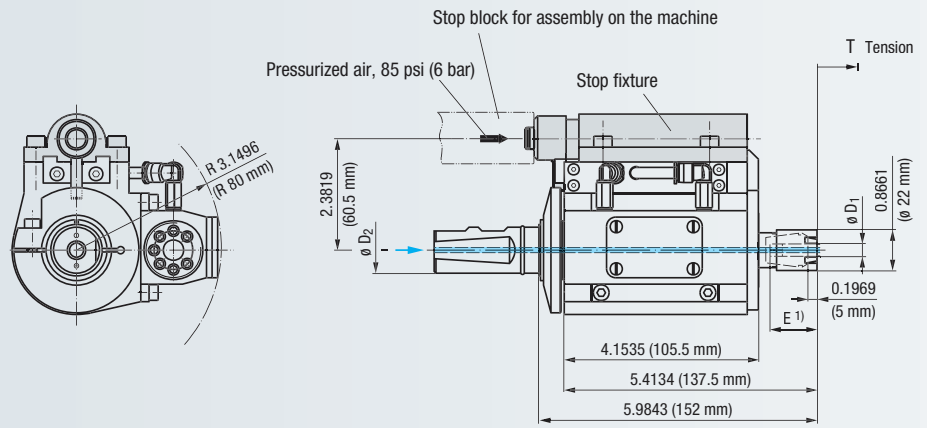
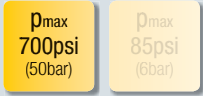


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER**
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info




## SWITCH-MASTER®

### Cylindrical Shank

DIN 1835 B



For use on machines with synchronous spindle, CNC machining centers and other machine tools

Type		$\varnothing D_1$			Shank Size $\varnothing D_2$	mm	T	Speed/rpm max.	Weight (lbs)	EDP Number
SWITCH-MASTER 16 MV 90°	M4 - M12	4.5 - 9 mm	ER 16 (GB)	Hi-Q/ERMC 16	25		9	3000	8.16	F3381392 ★

1) Clamping depth E, see page 428 - 429

The tapping attachment requires auxiliary energy = pressurized air 85  $\pm$ 14 psi (6  $\pm$ 1.5 bar) for reversing

Adapter shank, stop block and stop fixture are not included in the delivery, please order separately

The transfer of pressurized air is effected by means of a special stop block mounted on the machine, and into which the stop fixture engages

#### Accessories



Adapter shanks, see page 412



Collets type ER (GB), see page 414 - 416



Sealing disks type DS/ER, see page 420

# SWITCH-MASTER®

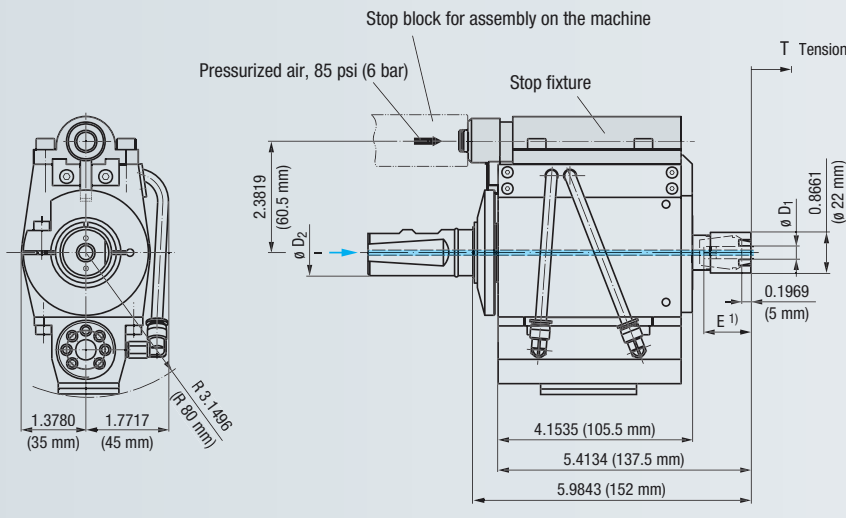
## Cylindrical Shank

DIN 1835 B



$p_{max}$ 700psi (50bar)	$p_{max}$ 85psi (6bar)

- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER**
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



For use on machines with synchronous spindle, CNC machining centers and other machine tools

Type		$\varnothing D_1$			Shank Size $\varnothing D_2$	mm T	Speed/rpm max.	Weight (lbs)	EDP Number	
<b>SWITCH-MASTER 16 MV 180°</b>	M4 - M12	4.5 - 9 mm	ER 16 (GB)	Hi-Q/ERMC 16	25	9	3000	8.16	<b>F3381397</b>	★

1) Clamping depth E, see page 428 - 429

The tapping attachment requires auxiliary energy = pressurized air 85  $\pm$  7<sup>14</sup> psi (6  $\pm$  0.5<sup>14</sup> bar) for reversing

Adapter shank, stop block and stop fixture are not included in the delivery, please order separately

The transfer of pressurized air is effected by means of a special stop block mounted on the machine, and into which the stop fixture engages

**Accessories**



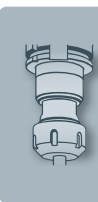
Adapter shanks, see page 412



Collets type ER (GB), see page 414 - 416

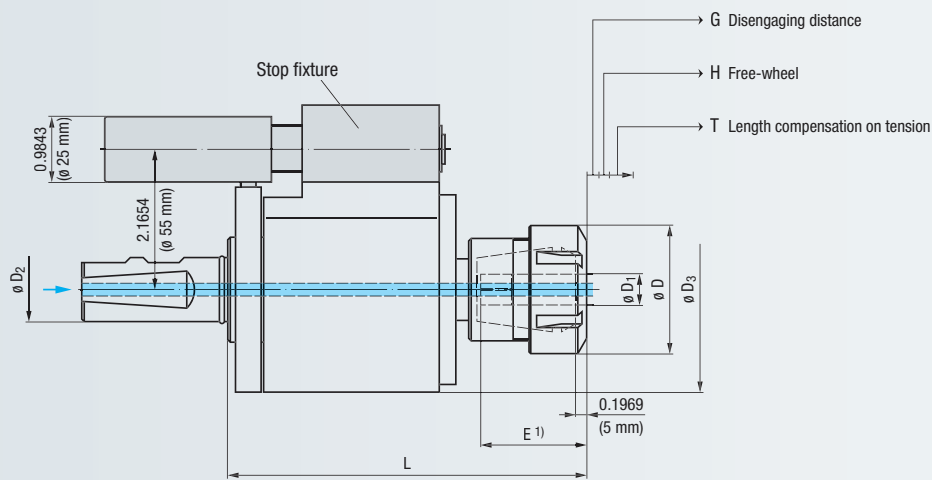
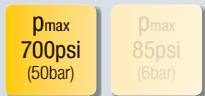


Sealing disks type DS/ER, see page 420



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC**
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## GRN-NC Cylindrical Shank DIN 1835 B+E



For use on machines with synchronous spindle, CNC machining centers and other machine tools

Type	Shank Size ø D <sub>2</sub>	mm	ø D	ø D <sub>3</sub>	L	G	H	T	Speed/rpm max.	Weight (lbs)	EDP Number	★			
													ø D <sub>1</sub>		
GRN-NC-20/HD	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERC 20	25	34	80	138	3.5	3	7	2500	6.17	F3392997	★
GRN-NC-25/HD	M8 - M20	8 - 16 mm	ER 25 (GB)	Hi-Q/ERC 25	25	42	80	142.2	3.5	3	7	1500	7.05	F3394997	★

1) Clamping depth E, see page 428 - 429

Standard stop fixture is included in the delivery

Please order adapter shanks and individually fitted stop fixtures separately

### Accessories



Adapter shanks, see page 412



Grease tube for lubrication (4 g) F339199.09



Collets type ER (GB), see page 414 - 416

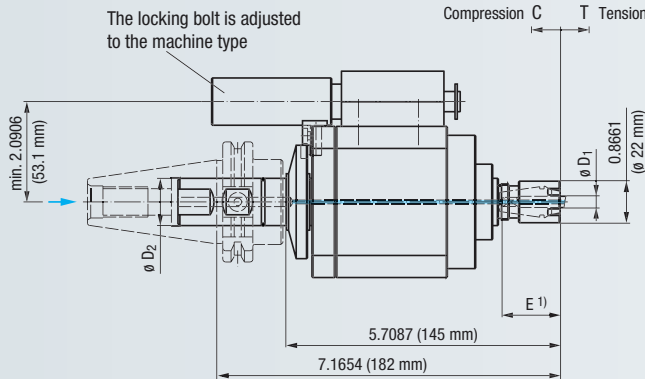
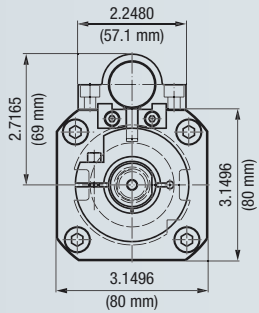
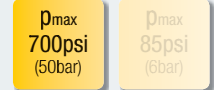


Sealing disks type DS/ER, see page 420

# SPEEDSYNCHRO®

## Cylindrical Shank

DIN 1835 B



For use on machines with synchronous spindle

Type		$\phi D_1$			Max. spindle speed	Transmission ratio	Shank Size $\phi D_2$ h6	mm		EDP Number	
								C	T		
SPEEDSYNCHRO® ER16	M1 - M8	2.5 - 8 mm	ER 16 (GB)	Hi-Q/ERMC 16	2000 rpm	1 : 4.412	25	0.5	0.5	F3351G26	★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

**Accessories**



Adapter shanks, see page 412



Collets type ER (GB), see page 414 - 416



Sealing disks type DS/ER, see page 420



Set of clamping wrenches, see page 425



Torque wrenches TORCO-FIX, see page 427

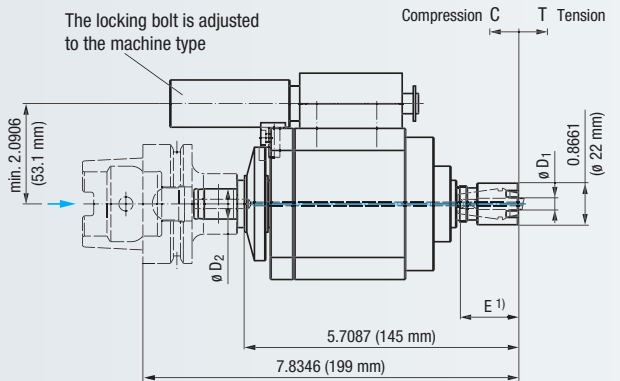
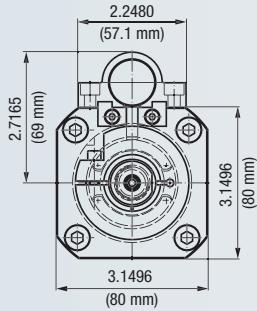
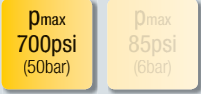
- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEEDSYNCHRO**
- HF
- EM
- Accessories
- Tech. Info



## SPEEDSYNCHRO®

### ABS® Shank

ABS®-clutch (System KOMET)



For use on machines with synchronous spindle

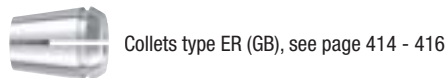
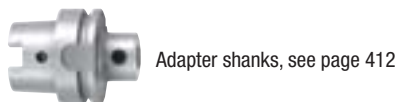
Type	Shank	ø D <sub>1</sub>	Collet	Sealing disk	Max. spindle speed	Transmission ratio	Shank Size ø D <sub>2</sub>	mm		EDP Number
								C	T	
SPEEDSYNCHRO® ER16	M1 - M8 (No.0 - 5/16)	2.5 - 8 mm (0.141 - 0.194)	ER 16 (GB)	Hi-Q/ERMC 16	2000 rpm	1 : 4.412	ABS 32	0.5	0.5	F3351L01 ★

1) Clamping depth E, see page 428 - 429

Further designs upon request

Clamping nut for sealing disks is included in the delivery

#### Accessories





Product  
FinderSoft-  
synchro

KSN

MQL

SFM

SWITCH-  
MASTER

GRN-NC

SPEED-  
SYNCHRO

HF

EM

Accessories

Tech. Info

## HF Series

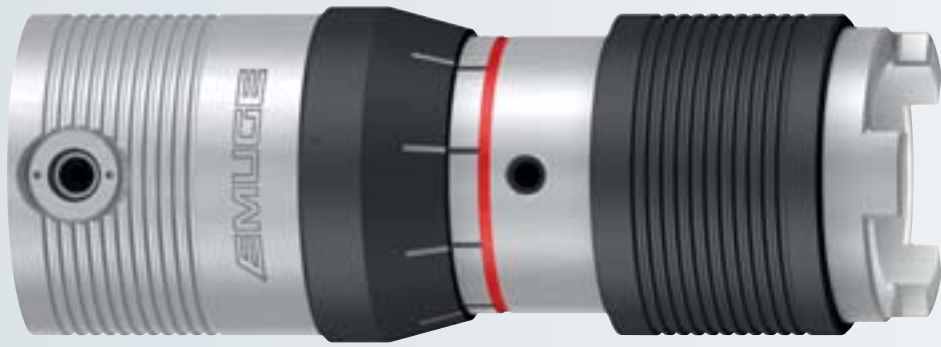
### Application on CNC machining centers and boring mills

For the production of big threads up to M160. Depending on the type: equipped with safety functions just like adjustable overload clutch and large length compensation.



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF**
- EM
- Accessories
- Tech. Info

## HF

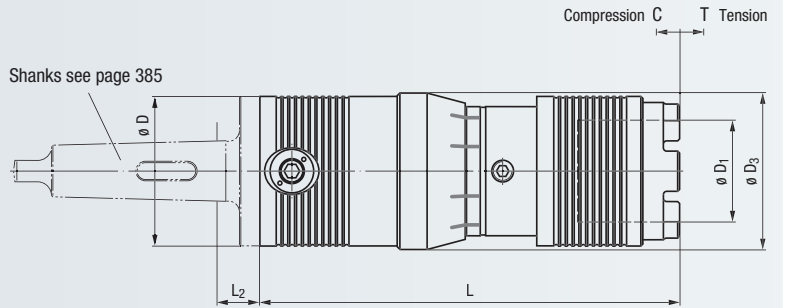


IKZ

MQL

$p_{max}$   
700psi  
(50bar)

$p_{max}$   
85psi  
(6bar)



For use on CNC machining centers,  
other machine tools and pillar drilling machines

Type	Image	Image	Maximum Permissible Torque	inch						Weight (lbs)	EDP Number	★
				$\phi D$	$\phi D_1$	$\phi D_3$	L	C	T			
HF 20	M24 - M76 (1 - 2 1/2)	HE 2	958 ft lbs (1300 Nm)	4.3307	2.9528	4.5276	12.1260	0.5906	0.5906	32.56	F0332999	★
HF 30	M36 - M160 (1 3/8 - 3 1/2)	HE 3	2213 ft lbs (3000 Nm)	6.2992	3.5433	6.2992	14.6457	0.7874	0.7874	80.30	F0333999	★

Available with internal coolant supply up to 10 bar upon request

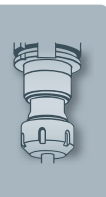
### Accessories



Quick-change adapters type HE, see page 388 - 389

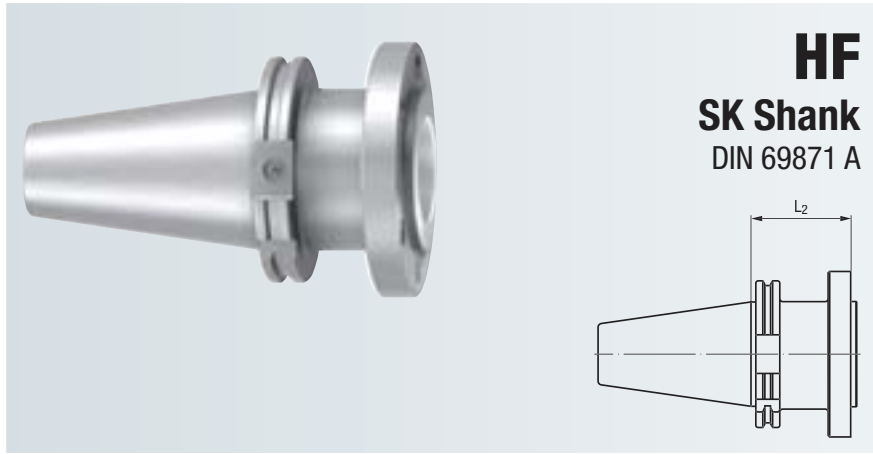


Shanks type HF, see page 385



For Type	Shank Size	mm		EDP Number	★
		L <sub>2</sub>	Weight (lbs)		
HF 20	SK 50	66	8.38	F033206.02	★
HF 30	SK 50	51	12.79	F033306.01	★

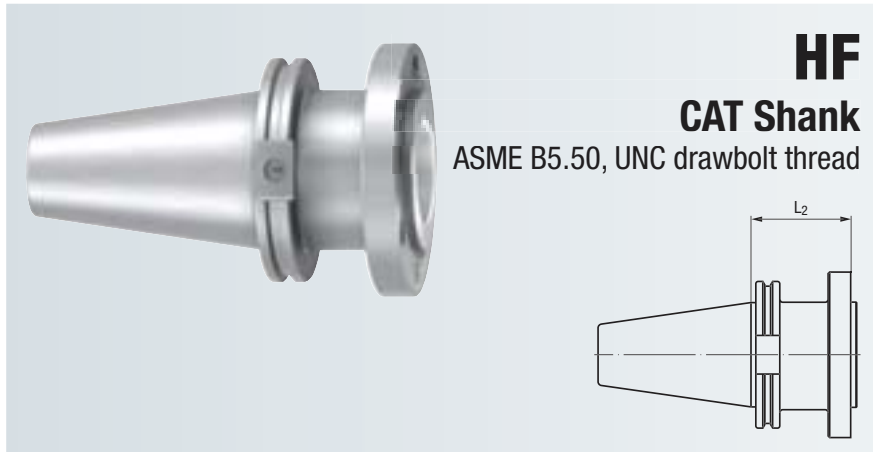
Available with internal coolant supply up to 10 bar upon request



**HF SK Shank**  
DIN 69871 A

For Type	Shank Size	inch		EDP Number	★
		L <sub>2</sub>	Weight (lbs)		
HF 20	CAT 50	2.6142	8.38	F033207.02	★
HF 30	CAT 50	2.0079	12.79	F033307.01	★

Available with internal coolant supply up to 10 bar upon request



**HF CAT Shank**  
ASME B5.50, UNC drawbolt thread

For Type	Shank Size	inch		EDP Number	★
		L <sub>2</sub>	Weight (lbs)		
HF 20	SK 40	0.8661	3.74	F033205.12	★
	SK 50	0.7087	6.60	F033205.11	★
HF 30	SK 50	0.7480	9.46	F033305.03	★
	SK 60	0.7480	22.22	F033305.04	★

Available with internal coolant supply up to 10 bar upon request



**HF SK Shank**  
ANSI B5.18, NMTF

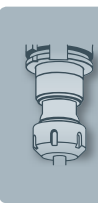
For Type	Shank Size	inch		EDP Number	★
		L <sub>2</sub>	Weight (lbs)		
HF 20	MT 4	1.3386	3.74	F033201.04	★
	MT 5	1.2598	6.16	F033201.05	★
	MT 6	1.2205	10.56	F033201.06	★
HF 30	MT 5	1.1811	8.58	F033301.01	★
	MT 6	1.2598	13.64	F033301.02	★

1) The "Keeper key slot" shown here is to DIN 228 B specifications and is different than ANSI B5.10 and ANSI B5.40. The taper shank will fit into Morse Taper Shank spindles, however the "Keeper key slot" is dimensionally different from the American Standard. "Keeper key slot" to ANSI B5.10 or ANSI B5.40 standards are available on a special order basis.



**HF Morse Taper Shank**  
DIN 228 B (ASME B5.10)

- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

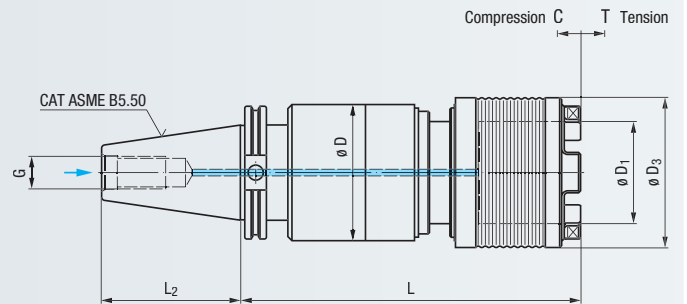
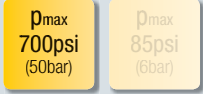


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF**
- EM
- Accessories
- Tech. Info

## HF/HD/Special

### CAT Shank

ASME B5.50, UNC drawbolt thread



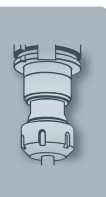
For use on CNC machining centers and other machine tools

Type	Image	Shank Size	inch								Weight (lbs)	EDP Number	
			$\phi D_1$	$\phi D_3$	L	L <sub>2</sub>	G	C	T				
HF 20/HD/Special	M24 - M76 (1 - 2 1/2)	HE2/IKZZ	CAT 50	2.9528	4.3307	9.8425	4.000	1 - 8	0.5906	0.5906	25.3	<b>F0332783.1.164</b>	★

#### Accessories

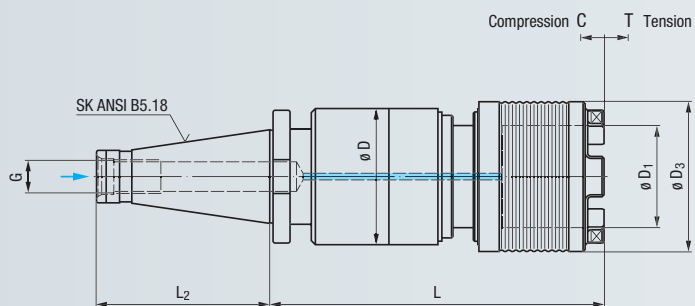


Quick-change adapters type HE/IKZZ, see page 388





# HF/HD/Special SK Shank

ANSI B5.18, NMTP



For use on CNC machining centers and other machine tools

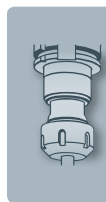
Type			Shank Size	inch							Weight (lbs)	EDP Number
				$\varnothing D_1$	$\varnothing D_3$	L	L <sub>2</sub>	G	C	T		
HF 20/HD/Special	M24 - M76 (1 - 2 1/2)	HE2/IKZZ	SK 50	2.9528	4.3307	9.6850	4.9921	1 - 8	0.5906	0.5906	25.3	<b>F0332543.1.164</b> ★

Accessories



Quick-change adapters type HE/IKZZ, see page 388

- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF**
- EM
- Accessories
- Tech. Info



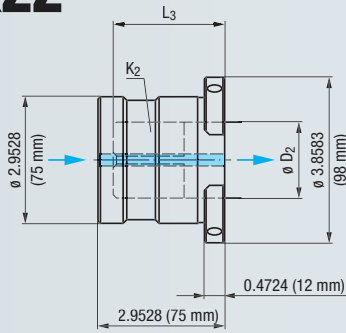
- Product Finder
- Soft-synchro
- KSN
- ML
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

For taps/roll form taps

### HE 2/IKZZ



$p_{max}$   
700psi  
(50bar)



DIN						ASME							
mm		mm	mm	Weight (lbs)	EDP Number	inch		inch	inch	Weight (lbs)	EDP Number		
$\phi D_2$	$K_2$					$\phi D_2$	$K_2$						
18	14.5	M24	53	4.85	F0632115.6	*	0.800	0.600	1	2.0866	4.62	F0632325.6	*
20	16	M27	53	4.85	F0632116.6	*	0.896	0.672	1 1/8	2.0866	4.62	F0632326.6	*
22	18	M30	53	4.63	F0632117.6	*	0.9063	0.679	3/4 NPT	1.6929	4.62	F0632355.6	*
25	20	M33	53	4.63	F0632118.6	*	1.021	0.766	1 1/4	2.0866	4.62	F0632327.6	*
28	22	M36	53	4.63	F0632119.6	*	1.108	0.831	1 3/8	2.0866	4.62	F0632328.6	*
32	24	M39 - M42	53	4.41	F0632120.6	*	1.125	0.843	1 NPT	1.6929	4.40	F0632356.6	*
36	29	M45 - M48	66	4.19	F0632121.6	*	1.233	0.925	1 1/2	2.0866	4.40	F0632329.6	*
40	32	M52 - M56	66	3.97	F0632122.6	*	1.305	0.979	1 5/8	2.0866	4.40	F0632330.6	*
45	35	M60	66	3.75	F0632123.6	*	1.3125	0.984	1 1/4 NPT	1.8504	4.40	F0632357.6	*
50	39	M64 - M76 / M80 <sup>1)</sup> - M90 <sup>1)</sup>	66	3.53	F0632124.6	*	1.430	1.072	1 3/4	2.5984	4.18	F0632331.6	*
56	44	M92 <sup>1)</sup> - M120 <sup>1)</sup>	66	3.09	F0632125.6	*	1.500	1.125	1 1/2 NPT	2.5984	4.18	F0632358.6	*
							1.519	1.139	1 7/8	2.5984	3.96	F0632332.6	*
							1.644	1.233	2	2.5984	3.96	F0632333.6	*
							1.769	1.327	2 1/8	2.5984	3.74	F0632334.6	*
							1.875	1.406	2 NPT	2.0866	3.74	F0632359.6	*
							1.894	1.420	2 1/4	2.5984	3.52	F0632335.6	*
							2.019	1.514	2 3/8	2.5984	3.52	F0632336.6	*
							2.100	1.575	2 1/2 - 3 <sup>1)</sup>	2.5984	3.30	F0632337.6	*
							2.225	1.669	2 5/8 <sup>1)</sup>	2.5984	2.86	F0632338.6	*
							2.250	1.687	2 1/2 NPT	2.0866	2.86	F0632360.6	*

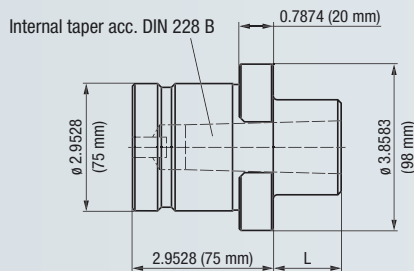
1) Fine threads

### HE 2

For drilling and countersinking

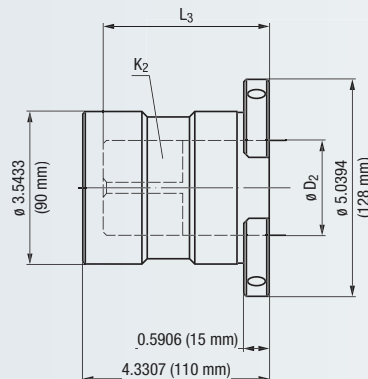


$p_{max}$   
700psi  
(50bar)



Internal taper	inch	Weight (lbs)	EDP Number
MT	L		
MT 3	0.9843	7.05	F0642803
MT 4	1.8898	7.28	F0642804
MT 5	3.1496	7.50	F0642805

For taps/roll form taps



**HE 3**



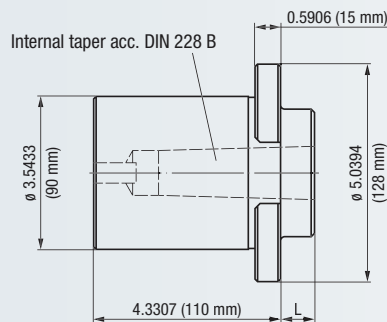
$p_{max}$   
700psi  
(50bar)

- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

DIN		mm	mm	Weight (lbs)	EDP Number	★	ASME		inch	inch	Weight (lbs)	EDP Number	★
$\varnothing D_2$	$K_2$						$\varnothing D_2$	$K_2$					
28	22	M36	76	9.70	F0633119	★	1.108	0.831	1 3/8	2.9921	9.68	F0633328	★
32	24	M39 - M42	76	9.48	F0633120	★	1.125	0.843	1 NPT	1.4567	9.68	F0633356	★
36	29	M45 - M48	76	9.26	F0633121	★	1.233	0.925	1 1/2	2.9921	9.46	F0633329	★
40	32	M52 - M56	76	8.82	F0633122	★	1.305	0.979	1 5/8	2.9921	9.46	F0633330	★
45	35	M60	76	8.60	F0633123	★	1.3125	0.984	1 1/4 NPT	1.5748	9.46	F0633357	★
50	39	M64 - M90	76	8.16	F0633124	★	1.430	1.072	1 3/4	2.9921	9.24	F0633331	★
56	44	M92 - M120	98	7.50	F0633125	★	1.500	1.125	1 1/2 NPT	1.7717	9.02	F0633358	★
63	49	M122 - M150	98	6.61	F0633126	★	1.519	1.139	1 7/8	2.9921	9.02	F0633332	★
70	55	M155 - M160	98	5.95	F0633127	★	1.644	1.233	2	2.9921	8.80	F0633333	★
							1.769	1.327	2 1/8	2.9921	8.58	F0633334	★
							1.875	1.406	2 NPT	1.9685	8.36	F0633359	★
							1.894	1.420	2 1/4	2.9921	8.36	F0633335	★
							2.019	1.514	2 3/8	2.9921	8.14	F0633336	★
							2.100	1.575	2 1/2 - 3	2.9921	7.92	F0633337	★
							2.225	1.669	2 5/8	3.6220	7.48	F0633338	★
							2.250	1.687	2 1/2 NPT	2.1654	7.48	F0633360	★
							2.350	1.762	2 3/4	3.6220	7.04	F0633339	★
							2.475	1.856	2 7/8	3.6220	6.60	F0633340	★
							2.543	1.907	3	3.6220	6.38	F0633341	★
							2.625	1.968	3 NPT	2.5591	6.16	F0633361	★
							2.668	2.001	3 1/8	3.6220	6.16	F0633342	★
							2.793	2.095	3 1/4	3.6220	7.02	F0633343	★
							2.8125	2.108	3 1/2 NPT	2.9921	5.72	F0633362	★

Available with internal coolant supply up to 10 bar upon request

For drilling and countersinking



**HE 3**

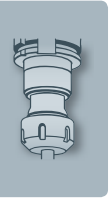


$p_{max}$   
700psi  
(50bar)

Internal taper	inch	Weight (lbs)	EDP Number	★
MT	L			
MT 3	0.7874	13.01	F0643804	★
MT 4	1.9685	13.23	F0643805	★
MT 5	4.5276	12.79	F0643806	★

★ = Allow 7 days for delivery

- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF**
- EM
- Accessories
- Tech. Info





Product  
FinderSoft-  
synchro

KSN

MQL

SFM

SWITCH-  
MASTER

GRN-NC

SPEED-  
SYNCHRO

HF

EM

Accessories

Tech. Info

## EM Series

### Suitable for all our quick-change tap holders of KSN and SFM series

Depending on the type: with coolant supply through the tool centre or along the shank, overload clutch and length adjustment. Clamping of the tool is achieved – depending on the type – by a ball clamping system, collets type ER (GB) or collets type PGR (GB).



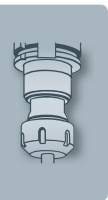
- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info



Page

<b>EM</b>	394	395	■					■	
<b>EM-E</b>	396	396	■					■	
<b>EM/IKZ</b>	397	398	■						■
<b>EM-U</b>	399	400	■			■		■	
<b>EM-U-E</b>	401	401	■			■		■	
<b>EM-U/IKZ</b>	402	403	■			■			■
<b>EM-Z/ER/IKZ</b>	404	404		■				■	■
<b>EM-L/ER/IKZ</b>	405	405		■			■		■
<b>EM/PGR/IKZ</b>	406				■			■	
<b>EM-R</b>	407	407							
<b>EM-S</b>	408							■	
<b>EM-LS</b>	409					■		■	

Description of the symbols for performance characteristics, see page 436 - 438

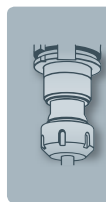


Recommended Range of Application

<p>Blind hole threads</p>	<p>Through hole threads</p>	Coarse thread	Fine thread	Clamping of solid carbide tools	For thermic shrinking of carbide tools with h6 shrank tolerance	High-speed machining	High coolant pressure	For use on multi-spindle machines and transfer lines
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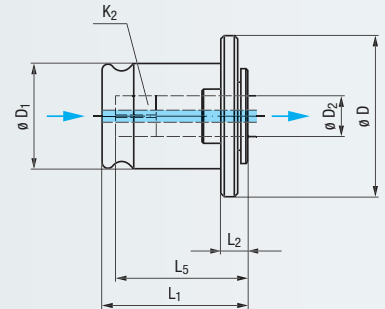
	■	■							<b>EM</b>
	■		■						<b>EM-E</b>
	■	■							<b>EM/IKZ</b>
■		■							<b>EM-U</b>
■			■						<b>EM-U-E</b>
■		■							<b>EM-U/IKZ</b>
	■	■		■		■	■		<b>EM-Z/ER/IKZ</b>
	■	■		■		■	■	■	<b>EM-L/ER/IKZ</b>
	■	■		■		■	■		<b>EM/PGR/IKZ</b>
■	■	■							<b>EM-R</b>
					■				<b>EM-S</b>
					■				<b>EM-LS</b>

- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info

## EM Metric DIN



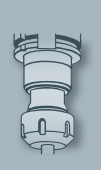
$p_{max}$   
700psi  
(50bar)

$p_{max}$   
85psi  
(6bar)

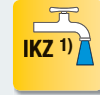
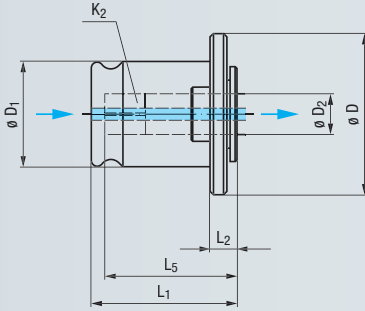
Type	EM00/DIN		EM01/DIN		EM03/DIN		EM04/DIN		EM05/DIN									
	M1 - M10		M3 - M14		M4.5 - M24		M14 - M36		M22 - M48									
<b>Quick-Change Adapter Dimensions (mm)</b>	$\varnothing D$	23	30	48	70	92												
	$\varnothing D_1$	13	19	31	48	60												
	$L_1$	27	29	45	67	111												
	$L_2$	7	7	10	11	48												
$\varnothing D_2$	$K_2$			EDP Number	$L_5$			EDP Number	$L_5$			EDP Number	$L_5$			EDP Number	$L_5$	
2.5	2.1	M1 - M1.8	M3.5	F0560100	20	●												
2.8	2.1	M2 - M2.6	M4	F0560101	20	●												
3.5	2.7	M3	M4.5 - M5	F0560102	21	●	F0561102	23	●									
4	3	M3.5	M5.5	F0560103	21	●	F0561103	23	●									
4.5	3.4	M4	M6	F0560104	21	●	F0561104	23	●									
6	4.9	M4.5 - M6	M8	F0560106	23	●	F0561106	25	●	F0563106	37	●						
7	5.5	M7	M9 - M10	F0560107	23	●	F0561107	25	●	F0563107	37	●						
8	6.2	M8	M11	2)			F0561108	26	●	F0563108	38	●						
9	7	M9	M12				F0561109	27	●	F0563109	39	●						
10	8	M10					F0561110	27	●	F0563110	40	●						
11	9		M14				F0561111	27	●	F0563111	41	●	F0564111	53	●			
12	9		M16				2)			F0563112	41	●	F0564112	53	●			
14	11		M18							F0563113	43	●	F0564113	55	●			
16	12		M20							F0563114	44	●	F0564114	56	●			
18	14.5		M22 - M24							F0563115	44	●	F0564115	58	●	F0565115	94	●
20	16		M27							2)			F0564116	60	●	F0565116	96	●
22	18		M30							2)			F0564117	62	●	F0565117	98	●
25	20		M33										F0564118	64	●	F0565118	100	●
28	22		M36										F0564119	66	●	F0565119	102	●
32	24		M39 - M42										2)			F0565120	104	●
36	29		M45 - M48										2)			F0565121	109	●
40	32		M52 - M56													2)		
45	35		M68													2)		

1) If used with taps / roll form taps with internal coolant supply

2) Quick-change adapters with extended clamping range type EM-E, see page 396



EM  
Inch  
ASME



$p_{max}$   
700psi  
(50bar)

$p_{max}$   
85psi  
(6bar)



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

Type	EM00/ASME	EM01/ASME	EM03/ASME	EM04/ASME	EM05/ASME
	No.0 - 1/4	No.0 - 9/16	1/4 - 7/8	5/8 - 1 3/8	7/8 - 1 7/8
<b>Quick-Change Adapter Dimensions (inch)</b>					
$\varnothing D$	0.87	1.18	1.89	2.76	3.62
$\varnothing D_1$	0.512	0.748	1.220	1.890	2.362
$L_1$	1.04	1.12	1.81	2.74	4.13
$L_2$	0.28	0.28	0.43	0.55	1.65

inch				EM00/ASME		EM01/ASME		EM03/ASME		EM04/ASME		EM05/ASME	
$\varnothing D_2$	$K_2$			EDP Number	$L_5$	EDP Number	$L_5$	EDP Number	$L_5$	EDP Number	$L_5$	EDP Number	$L_5$
0.141	0.110	No.0 - No.6	F0560300	0.787	F0561300	0.866							
0.168	0.131	No.8	F0560301	0.846	F0561301	0.945							
0.194	0.152	No.10	F0560302	0.846	F0561302	0.945							
0.220	0.165	No.12	F0560303	0.886	F0561303	0.965							
0.255	0.191	1/4	F0560304	0.925	F0561304	1.004	F0563304	1.339					
0.3125	0.234	1/16 NPT			F0561350	1.063	F0563350	1.181					
0.318	0.238	5/16			F0561306	1.063	F0563306	1.398					
0.381	0.286	3/8			F0561311	1.122	F0563311	1.457					
0.323	0.242			7/16	F0561307	1.102	F0563307	1.437					
0.367	0.275			1/2	F0561310	1.122	F0563310	1.457					
0.429	0.322			9/16	F0561313	1.102	F0563313	1.535					
0.4375	0.328	1/8 NPT			F0561351	1.063	F0563351	1.181					
0.480	0.360			5/8			F0563315	1.594	F0564315	1.673			
0.542	0.406			11/16			F0563317	1.654	F0564317	1.732			
0.5625	0.421	1/4 NPT					F0563352	1.161	F0564352	1.240			
0.590	0.442			3/4			F0563319	1.713	F0564319	1.791			
0.652	0.489			13/16			F0563321	1.713	F0564321	1.791			
0.6875	0.515			1/2 NPT			F0563353	1.417	F0564353	1.496			
0.697	0.523			7/8			F0563323	1.772	F0564323	1.850	F0565323	2.402	
0.700	0.531	3/8 NPT					F0563354	1.299	F0564354	1.378	F0565354	1.398	
0.800	0.600			1					F0564325	2.382	F0565325	2.461	
0.896	0.672			1 1/8					F0564326	2.441	F0565326	2.520	
0.9063	0.679			3/4 NPT					F0564355	1.634	F0565355	1.673	
1.021	0.766			1 1/4					F0564327	2.579	F0565327	2.657	
1.108	0.831			1 3/8					F0564328	2.638	F0565328	2.717	
1.125	0.843			1 NPT					F0564356	1.752	F0565356	1.791	
1.233	0.925			1 1/2							F0565329	2.776	
1.305	0.979			1 5/8							F0565330	2.776	
1.430	1.072			1 3/4							F0565331	2.913	
1.519	1.139			1 7/8							F0565332	2.913	
1.644	1.233			2									

● = In stock

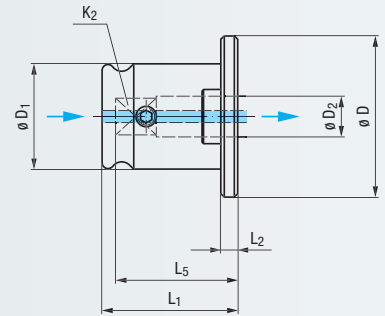
1) If used with taps / roll form taps with internal coolant supply

2) Quick-change adapters with extended clamping range type EM-E, see page 396

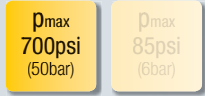
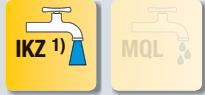


For the cutting of fine threads

## EM-E Metric / Inch DIN / ASME



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



Type	EM00-E/DIN	EM01-E/DIN	EM03-E/DIN	EM04-E/DIN	EM05-E/DIN
Fine thread	M8 - M11	M16	M27 - M30	M39 - M48	M52 - M60
<b>Quick-Change Adapter Dimensions (mm)</b>					
$\varnothing D$	23	30	48	70	92
$\varnothing D_1$	13	19	31	48	60
$L_1$	23.5	25.5	40	61.5	84
$L_2$	7	4	5	6	21

DIN		mm		EDP Number		EDP Number		EDP Number		EDP Number		EDP Number			
$\varnothing D_2$	$K_2$				$L_5$		$L_5$		$L_5$		$L_5$		$L_5$		
8	6.2	M8	M11	F0800108	21	•	F0801112	25	•	F0803116	39	•	F0804120	61	•
12	9		M16							F0803117	39	•			
20	16		M27										F0804121	60	•
22	18		M30												
32	24		M39 - M42												
36	29		M45 - M48												
40	32		M52 - M56										F0805122	83	•
45	35		M60										F0805123	83	•

Type	EM01-E/ASME	EM03-E/ASME	EM04-E/ASME	EM05-E/ASME
Fine thread	5/8	1 - 1 1/8	1 1/2	2
<b>Quick-Change Adapter Dimensions (inch)</b>				
$\varnothing D$	1.18	1.89	2.76	3.62
$\varnothing D_1$	0.748	1.220	1.890	2.362
$L_1$	1.004	1.57	2.42	3.31
$L_2$	0.157	0.197	0.236	0.512

ASME		inch		EDP Number		EDP Number		EDP Number		EDP Number		
$\varnothing D_2$	$K_2$				$L_5$		$L_5$		$L_5$		$L_5$	
0.480	0.360		5/8	F0801315	1.004	•	F0803325	1.516	•	F0804329	2.244	•
0.800	0.600		1									
0.896	0.672		1 1/8									
1.233	0.925		1 1/2									
1.644	1.233		2							F0805333	3.346	•

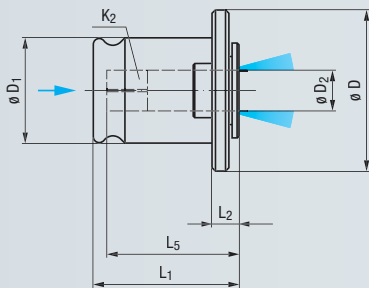
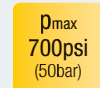
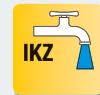
1) If used with taps with internal coolant supply

For taps / roll form taps without internal coolant supply



**EM/IKZ**  
Metric  
DIN

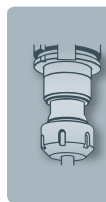
Along the tool shank



Type	EM01/IKZ/DIN	EM03/IKZ/DIN	EM04/IKZ/DIN	EM05/IKZ/DIN
	M3 - M14	M4.5 - M24	M14 - M36	M22 - M48
<b>Quick-Change Adapter Dimensions (mm)</b>				
ø D	30	48	70	92
ø D1	19	31	48	60
L1	29	45	67	111
L2	7	10	11	48

mm		mm		mm		mm		mm		mm	
ø D <sub>2</sub>	K <sub>2</sub>			EDP Number	L <sub>5</sub>	EDP Number	L <sub>5</sub>	EDP Number	L <sub>5</sub>	EDP Number	L <sub>5</sub>
2.5	2.1	M1 - M1.8	M3.5								
2.8	2.1	M2 - M2.6	M4								
3.5	2.7	M3	M4.5 - M5	<b>F0561102.5</b>	21 ●						
4	3	M3.5	M5.5	<b>F0561103.5</b>	23 ●						
4.5	3.4	M4	M6	<b>F0561104.5</b>	23 ●						
6	4.9	M4.5 - M6	M8	<b>F0561106.5</b>	25 ●	<b>F0563106.5</b>	37 ●				
7	5.5	M7	M9 - M10	<b>F0561107.5</b>	25 ●	<b>F0563107.5</b>	37 ●				
8	6.2	M8	M11	<b>F0561108.5</b>	26 ●	<b>F0563108.5</b>	38 ●				
9	7	M9	M12	<b>F0561109.5</b>	27 ●	<b>F0563109.5</b>	39 ●				
10	8	M10		<b>F0561110.5</b>	27 ●	<b>F0563110.5</b>	40 ●				
11	9		M14	<b>F0561111.5</b>	27 ●	<b>F0563111.5</b>	41 ●	<b>F0564111.5</b>	53 ●		
12	9		M16			<b>F0563112.5</b>	41 ●	<b>F0564112.5</b>	53 ●		
14	11		M18			<b>F0563113.5</b>	43 ●	<b>F0564113.5</b>	55 ●		
16	12		M20			<b>F0563114.5</b>	44 ●	<b>F0564114.5</b>	56 ●		
18	14.5		M22 - M24			<b>F0563115.5</b>	44 ●	<b>F0564115.5</b>	58 ●	<b>F0565115.5</b>	94 ●
20	16		M27					<b>F0564116.5</b>	60 ●	<b>F0565116.5</b>	96 ●
22	18		M30					<b>F0564117.5</b>	62 ●	<b>F0565117.5</b>	98 ●
25	20		M33					<b>F0564118.5</b>	64 ●	<b>F0565118.5</b>	100 ●
28	22		M36					<b>F0564119.5</b>	66 ●	<b>F0565119.5</b>	102 ●
32	24		M39 - M42							<b>F0565120.5</b>	104 ●
36	29		M45 - M48							<b>F0565121.5</b>	109 ●

- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



- Product Finder
- Soft-synchro
- KSN
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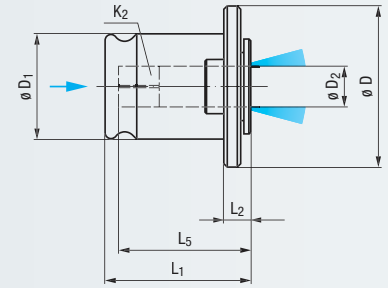
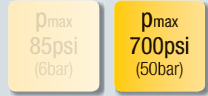
## EM/IKZ

Inch  
ASME

For taps / roll form taps without internal coolant supply



Along the tool shank



Type	EM01/IKZ/ASME	EM03/IKZ/ASME	EM04/IKZ/ASME	EM05/IKZ/ASME
	No.0 - 9/16	1/4 - 7/8	5/8 - 1 3/8	7/8 - 1 7/8
<b>Quick-Change Adapter Dimensions (inch)</b>				
$\varnothing D$	1.18	1.89	2.76	3.62
$\varnothing D_1$	0.748	1.220	1.890	2.362
$L_1$	1.12	1.81	2.74	4.13
$L_2$	0.28	0.43	0.55	1.65

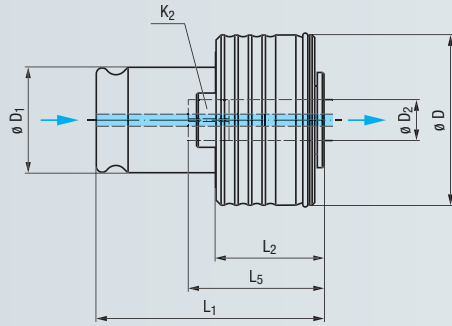
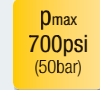
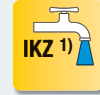
inch				EM01		EM03		EM04		EM05	
$\varnothing D_2$	$K_2$			EDP Number	$L_5$	EDP Number	$L_5$	EDP Number	$L_5$	EDP Number	$L_5$
0.141	0.110	No.0 - No.6	F0561300.5	0.866	F0563300.5	0.866	F0564300.5	0.866	F0565300.5	0.866	
0.168	0.131	No.8	F0561301.5	0.945	F0563301.5	0.945	F0564301.5	0.945	F0565301.5	0.945	
0.194	0.152	No.10	F0561302.5	0.945	F0563302.5	0.945	F0564302.5	0.945	F0565302.5	0.945	
0.220	0.165	No.12	F0561303.5	0.965	F0563303.5	0.965	F0564303.5	0.965	F0565303.5	0.965	
0.255	0.191	1/4	F0561304.5	1.004	F0563304.5	1.004	F0564304.5	1.004	F0565304.5	1.004	
0.3125	0.234	1/16 NPT	F0561350.5	1.063	F0563350.5	1.063	F0564350.5	1.063	F0565350.5	1.063	
0.318	0.238	5/16	F0561306.5	1.063	F0563306.5	1.063	F0564306.5	1.063	F0565306.5	1.063	
0.381	0.286	3/8	F0561311.5	1.122	F0563311.5	1.122	F0564311.5	1.122	F0565311.5	1.122	
0.323	0.242	7/16	F0561307.5	1.102	F0563307.5	1.102	F0564307.5	1.102	F0565307.5	1.102	
0.367	0.275	1/2	F0561310.5	1.122	F0563310.5	1.122	F0564310.5	1.122	F0565310.5	1.122	
0.429	0.322	9/16	F0561313.5	1.102	F0563313.5	1.102	F0564313.5	1.102	F0565313.5	1.102	
0.4375	0.328	1/8 NPT	F0561351.5	1.063	F0563351.5	1.063	F0564351.5	1.063	F0565351.5	1.063	
0.480	0.360	5/8	F0561315.5	1.181	F0563315.5	1.181	F0564315.5	1.181	F0565315.5	1.181	
0.542	0.406	11/16	F0561317.5	1.240	F0563317.5	1.240	F0564317.5	1.240	F0565317.5	1.240	
0.5625	0.421	1/4 NPT	F0561352.5	1.161	F0563352.5	1.161	F0564352.5	1.161	F0565352.5	1.161	
0.590	0.442	3/4	F0561319.5	1.240	F0563319.5	1.240	F0564319.5	1.240	F0565319.5	1.240	
0.652	0.489	13/16	F0561321.5	1.240	F0563321.5	1.240	F0564321.5	1.240	F0565321.5	1.240	
0.6875	0.515	1/2 NPT	F0561353.5	1.161	F0563353.5	1.161	F0564353.5	1.161	F0565353.5	1.161	
0.697	0.523	7/8	F0561323.5	1.279	F0563323.5	1.279	F0564323.5	1.279	F0565323.5	1.279	
0.700	0.531	3/8 NPT	F0561354.5	1.181	F0563354.5	1.181	F0564354.5	1.181	F0565354.5	1.181	
0.800	0.600	1	F0561325.5	1.382	F0563325.5	1.382	F0564325.5	1.382	F0565325.5	1.382	
0.896	0.672	1 1/8	F0561326.5	1.441	F0563326.5	1.441	F0564326.5	1.441	F0565326.5	1.441	
0.9063	0.679	3/4 NPT	F0561355.5	1.634	F0563355.5	1.634	F0564355.5	1.634	F0565355.5	1.634	
1.021	0.766	1 1/4	F0561327.5	1.579	F0563327.5	1.579	F0564327.5	1.579	F0565327.5	1.579	
1.108	0.831	1 3/8	F0561328.5	1.638	F0563328.5	1.638	F0564328.5	1.638	F0565328.5	1.638	
1.125	0.843	1 NPT	F0561356.5	1.752	F0563356.5	1.752	F0564356.5	1.752	F0565356.5	1.752	
1.233	0.925	1 1/2	F0561329.5	1.776	F0563329.5	1.776	F0564329.5	1.776	F0565329.5	1.776	
1.305	0.979	1 5/8	F0561330.5	1.776	F0563330.5	1.776	F0564330.5	1.776	F0565330.5	1.776	
1.430	1.072	1 3/4	F0561331.5	1.913	F0563331.5	1.913	F0564331.5	1.913	F0565331.5	1.913	
1.519	1.139	1 7/8	F0561332.5	1.913	F0563332.5	1.913	F0564332.5	1.913	F0565332.5	1.913	



With overload clutch



**EM-U**  
Metric  
DIN



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info

Type	EM00-U/DIN	EM01-U/DIN	EM03-U/DIN	EM04-U/DIN	EM05-U/DIN
	M1 - M10	M3 - M14	M4.5 - M24	M14 - M36	M22 - M48
<b>Quick-Change Adapter Dimensions (mm)</b>					
ø D	24	33	50	72	95
ø D <sub>1</sub>	13	19	31	48	60
L <sub>1</sub>	41.5	47	69	101	138
L <sub>2</sub>	22	25	34	45	75

mm				EDP Number		EDP Number		EDP Number		EDP Number		EDP Number						
ø D <sub>2</sub>	K <sub>2</sub>				L <sub>5</sub>		L <sub>5</sub>		L <sub>5</sub>		L <sub>5</sub>		L <sub>5</sub>					
2.5	2.1	M1 - M1.8		F0570100.1	21	●												
2.5	2.1		M3.5	F0570100.2	21	●												
2.8	2.1	M2		F0570101.1	21	●												
2.8	2.1	M2.5		F0570101.2	21	●												
2.8	2.1		M4	F0570101.3	21	●												
3.5	2.7	M3		F0570102.1	22	●	F0571102.1	23	●									
3.5	2.7		M4.5 - M5	F0570102.2	22	●	F0571102.2	23	●									
4	3	M3.5		F0570103	22	●	F0571103	23	●									
4.5	3.4	M4		F0570104.1	22	●	F0571104.1	23	●									
4.5	3.4		M6	F0570104.2	22	●	F0571104.2	23	●									
6	4.9	M4.5 - M5		F0570106.1	24	●	F0571106.1	25	●	F0573106.1	38	●						
6	4.9	M6		F0570106.2	24	●	F0571106.2	25	●	F0573106.2	38	●						
6	4.9		M8	F0570106.3	24	●	F0571106.3	25	●	F0573106.3	38	●						
7	5.5		M10	F0570107	24	●	F0571107	25	●	F0573107	38	●						
8	6.2	M8		2)			F0571108	26	●	F0573108	39	●						
9	7		M12				F0571109	27	●	F0573109	40	●						
10	8	M10					F0571110	28	●	F0573110	41	●						
11	9		M14				F0571111	29	●	F0573111	42	●	F0574111	56	●			
12	9		M16				2)			F0573112	42	●	F0574112	56	●			
14	11		M18							F0573113	44	●	F0574113	58	●			
16	12		M20							F0573114	45	●	F0574114	59	●			
18	14.5		M22 - M24							F0573115	47	●	F0574115	61	●	F0575115	94	●
20	16		M27							2)			F0574116	63	●	F0575116	96	●
22	18		M30							2)			F0574117	65	●	F0575117	98	●
25	20		M33										F0574118	67	●	F0575118	100	●
28	22		M36										F0574119	69	●	F0575119	102	●
32	24		M39 - M42							2)						F0575120	104	●
36	29		M45 - M48							2)						F0575121	109	●
40	32		M52 - M56													2)		
45	35		M60													2)		

● = In stock

1) If used with taps / roll form taps with internal coolant supply

2) Quick-change adapters with extended clamping range type EM-U-E, see page 401

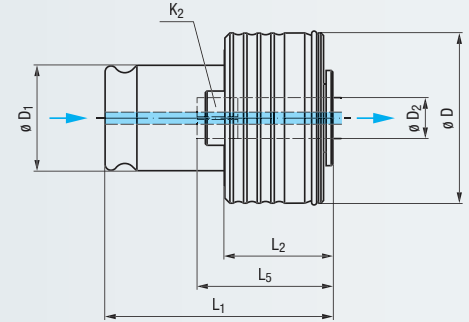


- Product Finder
- Soft-synchro
- KSN
- MQL
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- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
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- EM
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- Tech. Info

## EM-U

### Inch ASME

With overload clutch



Type	EM00-U/ASME	EM01-U/ASME	EM03-U/ASME	EM04-U/ASME	EM05-U/ASME
	No.0 - 1/4	No.0 - 9/16	1/4 - 7/8	5/8 - 1 3/8	7/8 - 1 7/8
<b>Quick-Change Adapter Dimensions (inch)</b>					
$\theta D$	0.93	1.30	1.97	2.83	3.74
$\theta D_1$	0.512	0.748	1.220	1.890	2.362
$L_1$	1.63	1.85	2.72	3.98	5.16
$L_2$	0.87	0.98	1.34	1.77	2.68

inch				EM00-U/ASME		EM01-U/ASME		EM03-U/ASME		EM04-U/ASME		EM05-U/ASME	
$\theta D_2$	$K_2$			EDP Number	$L_5$	EDP Number	$L_5$	EDP Number	$L_5$	EDP Number	$L_5$	EDP Number	$L_5$
0.141	0.110	No.0 - No.6	F0570300	0.819	F0571300	0.870							
0.168	0.131	No.8	F0570301	0.882	F0571301	0.933							
0.194	0.152	No.10	F0570302	0.882	F0571302	0.933							
0.220	0.165	No.12	F0570303	0.909	F0571303	0.961							
0.255	0.191	1/4	F0570304	0.941	F0571304	0.992	F0573304	1.280					
0.3125	0.234	1/16 NPT			F0571350	1.055	F0573350	1.055					
0.318	0.238	5/16			F0571306	1.055	F0573306	1.343					
0.381	0.286	3/8			F0571311	1.118	F0573311	1.406					
0.323	0.242				F0571307	1.087	F0573307	1.374					
0.367	0.275				F0571310	1.118	F0573310	1.406					
0.429	0.322				F0571313	1.181	F0573313	1.469					
0.4375	0.328	1/8 NPT			F0571351	1.055	F0573351	1.055					
0.480	0.360						F0573315	1.531	F0574315	1.531			
0.542	0.406						F0573317	1.594	F0574317	1.594			
0.5625	0.421	1/4 NPT					F0573352	1.110	F0574352	1.110			
0.590	0.442						F0573319	1.657	F0574319	1.657			
0.652	0.489						F0573321	1.657	F0574321	1.657			
0.6875	0.515						F0573353	1.339	F0574353	1.339			
0.697	0.523						F0573323	1.720	F0574323	1.720	F0575323	2.319	
0.700	0.531	3/8 NPT					F0573354	1.213	F0574354	1.213	F0575354	1.213	
0.800	0.600								F0574325	2.315	F0575325	2.378	
0.896	0.672								F0574326	2.350	F0575326	2.441	
0.9063	0.679								F0574355	1.496	F0575355	1.496	
1.021	0.766								F0574327	2.476	F0575327	2.567	
1.108	0.831								F0574328	2.539	F0575328	2.630	
1.125	0.843								F0574356	1.618	F0575356	1.618	
1.233	0.925										F0575329	2.693	
1.305	0.979										F0575330	2.693	
1.430	1.072										F0575331	2.819	
1.519	1.139										F0575332	2.819	
1.644	1.233												

1) If used with taps / roll form taps with internal coolant supply

2) Quick-change adapters with extended clamping range type EM-U-E, see page 401

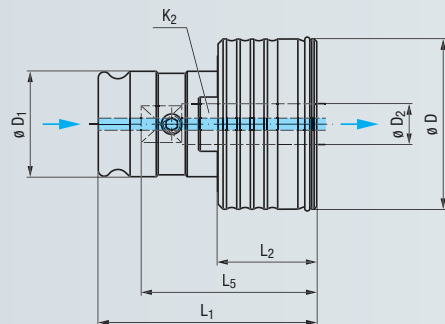
3)  $L_1 = 5.00$

$L_2 = 2.52$

For the cutting of fine threads  
With overload clutch



**EM-U-E**  
Metric / Inch  
DIN / ASME



- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info

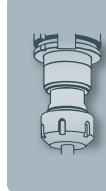
Type	EM00-U-E/DIN	EM01-U-E/DIN	EM03-U-E/DIN	EM04-U-E/DIN	EM05-U-E/DIN	
Fine thread	M8 - M11	M16	M27 - M30	M39 - M48	M52 - M60	
Quick-Change Adapter Dimensions (mm)	ø D	24	33	50	72	95
	ø D <sub>1</sub>	13	19	31	48	60
	L <sub>1</sub>	38.5	44	64.5	96	125
	L <sub>2</sub>	19	22.5	29.5	40.5	62

DIN		mm		EDP Number		L <sub>5</sub>		EDP Number		L <sub>5</sub>		EDP Number		L <sub>5</sub>		EDP Number		L <sub>5</sub>	
ø D <sub>2</sub>	K <sub>2</sub>																		
8	6.2	M8	M11	F0810108	28	●													
12	9		M16				F0811112	37	●										
20	16		M27							F0813116	50	●							
22	18		M30							F0813117	52	●							
32	24		M39 - M42										F0814120	66	●				
36	29		M45 - M48										F0814121	71	●				
40	32		M52 - M56													F0815122	91	●	
45	35		M60													F0815123	94	●	

Type	EM01-U-E/ASME	EM03-U-E/ASME	EM04-U-E/ASME	EM05-U-E/ASME	
Fine thread	5/8	1 - 1 1/8	1 1/2	2	
Quick-Change Adapter Dimensions (inch)	ø D	1.30	1.97	2.83	3.74
	ø D <sub>1</sub>	0.748	1.220	1.890	2.362
	L <sub>1</sub>	1.73	2.54	3.78	4.92
	L <sub>2</sub>	0.89	1.16	1.59	2.44

ASME		inch		EDP Number		L <sub>5</sub>		EDP Number		L <sub>5</sub>		EDP Number		L <sub>5</sub>		EDP Number		L <sub>5</sub>	
ø D <sub>2</sub>	K <sub>2</sub>																		
0.480	0.360		5/8			F0811315	1.535	●											
0.800	0.600		1						F0813325	2.047	●								
0.896	0.672		1 1/8						F0813326	2.106	●								
1.233	0.925		1 1/2									F0814329	2.598	●					
1.644	1.233		2												F0815333	3.425	●		

1) If used with taps with internal coolant supply



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## EM-U/IKZ

Metric

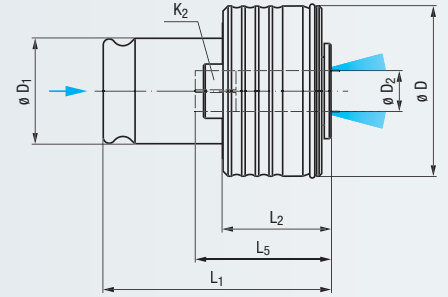
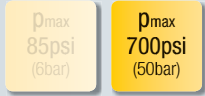
DIN

For taps / roll form taps without internal coolant supply

With overload clutch

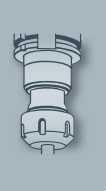


Along the tool shank



Type	EM01-U/IKZ/DIN	EM03-U/IKZ/DIN	EM04-U/IKZ/DIN	EM05-U/IKZ/DIN
	M3 - M14	M4.5 - M24	M14 - M36	M22 - M48
<b>Quick-Change Adapter Dimensions (mm)</b>				
$\varnothing D$	33	50	72	95
$\varnothing D_1$	19	31	48	60
$L_1$	47	69	101	138
$L_2$	25	34	45	75

mm				EDP Number		EDP Number		EDP Number		EDP Number					
$\varnothing D_2$	$K_2$				$L_5$		$L_5$		$L_5$		$L_5$				
2.5	2.1	M1 - M1.8	M3.5												
2.8	2.1	M2 - M2.5	M4												
3.5	2.7	M3		F0571102.1.5	22	●									
3.5	2.7		M4.5 - M5	F0571102.2.5	22	●									
4	3	M3.5		F0571103.5	22	●									
4.5	3.4	M4		F0571104.1.5	23	●									
4.5	3.4		M6	F0571104.2.5	23	●									
6	4.9	M4.5 - M5		F0571106.1.5	25	●	F0573106.1.5	38	●						
6	4.9	M6		F0571106.2.5	25	●	F0573106.2.5	38	●						
6	4.9		M8	F0571106.3.5	25	●	F0573106.3.5	38	●						
7	5.5		M10	F0571107.5	25	●	F0573107.5	38	●						
8	6.2	M8		F0571108.5	26	●	F0573108.5	39	●						
9	7		M12	F0571109.5	27	●	F0573109.5	40	●						
10	8	M10		F0571110.5	28	●	F0573110.5	41	●						
11	9		M14	F0571111.5	29	●	F0573111.5	42	●	F0574111.5	56	●			
12	9		M16				F0573112.5	42	●	F0574112.5	56	●			
14	11		M18				F0573113.5	44	●	F0574113.5	58	●			
16	12		M20				F0573114.5	45	●	F0574114.5	59	●			
18	14.5		M22 - M24				F0573115.5	47	●	F0574115.5	61	●	F0575115.5	94	●
20	16		M27							F0574116.5	63	●	F0575116.5	96	●
22	18		M30							F0574117.5	65	●	F0575117.5	98	●
25	20		M33							F0574118.5	67	●	F0575118.5	100	●
28	22		M36							F0574119.5	69	●	F0575119.5	102	●
32	24		M39 - M42										F0575120.5	104	●
36	29		M45 - M48										F0575121.5	109	●



For taps / roll form taps without internal coolant supply

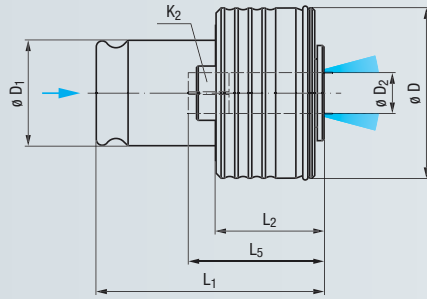
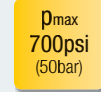
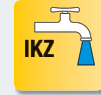
With overload clutch



**EM-U/IKZ**

Inch  
ASME

Along the tool shank



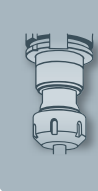
Type	EM01-U/IKZ/ASME	EM03-U/IKZ/ASME	EM04-U/IKZ/ASME	EM05-U/IKZ/ASME
	No.0 - 9/16	1/4 - 7/8	5/8 - 1 3/8	7/8 - 1 7/8
<b>Quick-Change Adapter Dimensions (inch)</b>				
$\theta D$	1.30	1.97	2.83	3.74
$\theta D_1$	0.748	1.220	1.890	2.362
$L_1$	1.85	2.72	3.98	5.16
$L_2$	0.98	1.34	1.77	2.68

inch				EDP Number	$L_5$	EDP Number	$L_5$	EDP Number	$L_5$	EDP Number	$L_5$
$\theta D_2$	$K_2$										
0.141	0.110	No.0 - No.6		<b>F0571300.5</b>	0.870	●					
0.168	0.131	No.8		<b>F0571301.5</b>	0.933	●					
0.194	0.152	No.10		<b>F0571302.5</b>	0.933	●					
0.220	0.165	No.12		<b>F0571303.5</b>	0.961	●					
0.255	0.191	1/4		<b>F0571304.5</b>	0.992	●	<b>F0573304.5</b>	1.280	●		
0.3125	0.234	1/16 NPT		<b>F0571350.5</b>	1.055	●	<b>F0573350.5</b>	1.055	●		
0.318	0.238	5/16		<b>F0571306.5</b>	1.055	●	<b>F0573306.5</b>	1.343	●		
0.381	0.286	3/8		<b>F0571311.5</b>	1.118	●	<b>F0573311.5</b>	1.406	●		
0.323	0.242		7/16	<b>F0571307.5</b>	1.087	●	<b>F0573307.5</b>	1.374	●		
0.367	0.275		1/2	<b>F0571310.5</b>	1.181	●	<b>F0573310.5</b>	1.406	●		
0.429	0.322		9/16	<b>F0571313.5</b>	1.181	●	<b>F0573313.5</b>	1.469	●		
0.4375	0.328	1/8 NPT					<b>F0573351.5</b>	1.055	●		
0.480	0.360		5/8				<b>F0573315.5</b>	1.531	●	<b>F0574315.5</b>	1.531
0.542	0.406		11/16				<b>F0573317.5</b>	1.594	●	<b>F0574317.5</b>	1.594
0.5625	0.421	1/4 NPT					<b>F0573352.5</b>	1.110	●	<b>F0574352.5</b>	1.110
0.590	0.442		3/4				<b>F0573319.5</b>	1.657	●	<b>F0574319.5</b>	1.657
0.652	0.489		13/16				<b>F0573321.5</b>	1.657	●	<b>F0574321.5</b>	1.657
0.6875	0.515		1/2 NPT				<b>F0573353.5</b>	1.339	●	<b>F0574353.5</b>	1.339
0.697	0.523		7/8				<b>F0573323.5</b>	1.720	●	<b>F0574323.5</b>	1.720
0.700	0.531	3/8 NPT					<b>F0573354.5</b>	1.213	●	<b>F0574354.5</b>	1.213
0.800	0.600		1							<b>F0575323.5</b>	2.319
0.896	0.672		1 1/8							<b>F0575325.5</b>	2.378
0.9063	0.679		3/4 NPT							<b>F0575326.5</b>	2.441
1.021	0.766		1 1/4							<b>F0575327.5</b>	2.567
1.108	0.831		1 3/8							<b>F0575328.5</b>	2.630
1.125	0.843		1 NPT							<b>F0575329.5</b>	2.693
1.233	0.925		1 1/2							<b>F0575330.5</b>	2.693
1.305	0.979		1 5/8							<b>F0575331.5</b>	2.819
1.430	1.072		1 3/4							<b>F0575332.5</b>	2.819
1.519	1.139		1 7/8								

● = In stock

<sup>3)</sup>  $L_1 = 5.00$   
 $L_2 = 2.52$

- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info

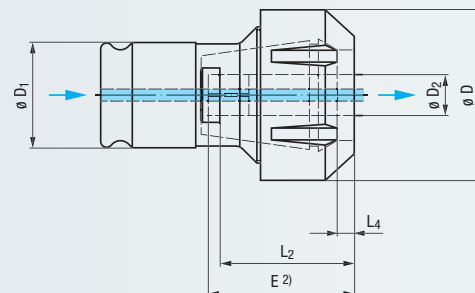


With collet adaption

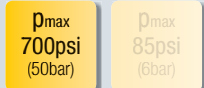
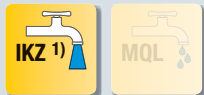
## EM-Z/ER/IKZ

Metric / Inch

DIN / ASME



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



Type	Image	$\varnothing D_2$	Image	Image	mm				EDP Number	
					$\varnothing D$	$\varnothing D_1$	$L_1$	$L_4$		
<b>EM 00-Z/ER/IKZ</b>		2.5 - 7 mm 0.141 - 0.194		ER 11 (GB)	19	13	23	0.9	<b>F0860001</b>	●
<b>EM 01-Z/ER/IKZ</b>		4.5 - 10 mm 0.168 - 0.381		ER 20 (GB)	34	19	34.5	5	<b>F0861001.13</b>	●
<b>EM 03-Z/ER/IKZ</b>		4.5 - 16 mm 0.255 - 0.590		ER 32 (GB)	50	31	41.5	5	<b>F0863001.13</b>	●

1) If used with taps / roll form taps with internal coolant supply

2) Clamping depth E, see page 428 - 429

### EM 00-Z/ER/IKZ

Clamping nut without integrated seal is included in the delivery

### EM 01-Z/ER/IKZ, EM 03-Z/ER/IKZ

Clamping nut for sealing disks is included in the delivery

### Accessories



Collets type ER (GB), see page 414 - 417



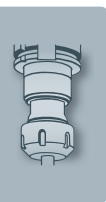
Sealing disks type DS/ER, see page 420



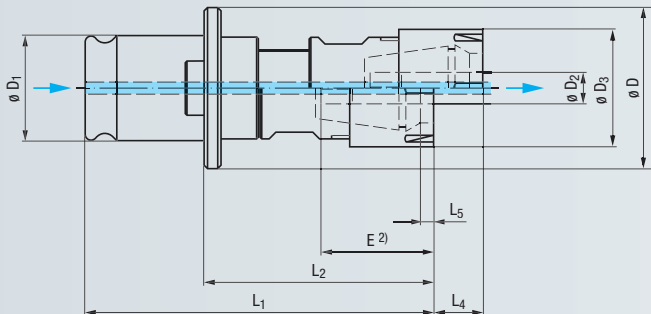
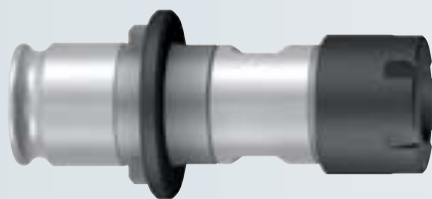
Clamping nut with integrated seal, type HI-Q/ERC 11, see page 423



Clamping wrench, see page 426



With collet adaption and length adjustment



**EM-L/ER/IKZ**  
Metric / Inch  
DIN / ASME



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info

Type		$\varnothing D_2$			mm							EDP Number	
					$\varnothing D$	$\varnothing D_1$	$\varnothing D_3$	$L_1$	$L_2$	$L_4$	$L_5$		
<b>EM 00-L/ER/IKZ</b>	M2 - M8 (No.2 - No.10)	2.5 - 7 mm 0.141 - 0.194	ER 11 (GB)	Hi-Q/ERM 11	23	13	16	57.5	38	8	0.9	<b>F3500011</b>	●
<b>EM 01-L/ER/IKZ</b>	M4 - M12 (No.8 - 1/2)	4.5 - 10 mm 0.168 - 0.381	ER 20 (GB)	Hi-Q/ERMC 20	30	19	22	72	50.5	10	5	<b>F3501016</b>	●
<b>EM 03-L/ER/IKZ</b>	M8 - M20	8 - 16 mm	ER 25 (GB)	Hi-Q/ERMC 25	48	31	35	103	68	15	5	<b>F3503025</b>	●

1) If used with taps / roll form taps with internal coolant supply

2) Clamping depth E, see page 428 - 429

**EM 00-L/ER/IKZ**

Clamping nut without integrated seal is included in the delivery

**EM 01-L/ER/IKZ, EM 03-L/ER/IKZ**

Clamping nut for sealing disks is included in the delivery

**Accessories**



Collets type ER (GB), see page 414 - 417



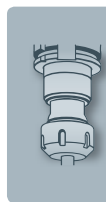
Sealing disks type DS/ER, see page 420



Clamping nut with integrated seal, type Hi-Q/ERMC 11, see page 422



Set of clamping wrenches, see page 426

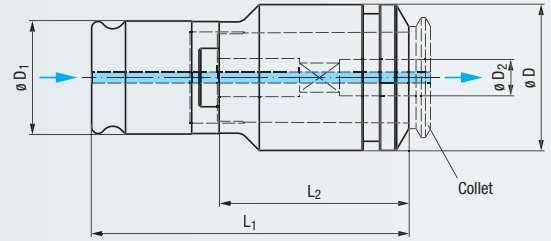
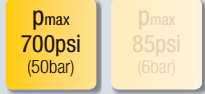
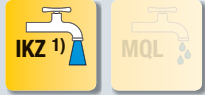


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info

## EM/PGR/IKZ

Metric

DIN



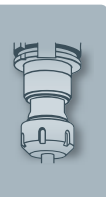
Type	Tap	$\varnothing D_2$	Tap	inch				EDP Number	★
				$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$		
EM 01/PGR/IKZ	M4 - M12 (No.10 - 1/4)	4.5 - 10 mm	PGR 15 GB	0.9449	0.7480	2.5197	1.6535	F3561015	★
EM 03/PGR/IKZ	M8 - M20 (1/4 - 3/4)	8 - 16 mm	PGR 25 GB	1.5748	1.2205	3.4252	2.0472	F3563025	★

1) If used with taps / roll form taps with internal coolant supply

### Accessories



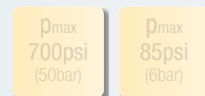
Collets type PGR-GB, see page 434



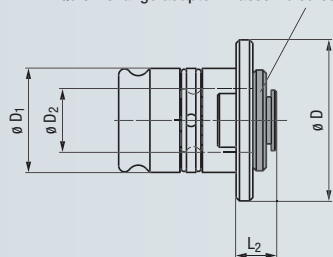





**EM-R**  
Metric / Inch  
DIN / ASME

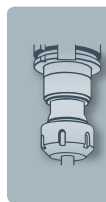


Quick-change adapter in assembled condition



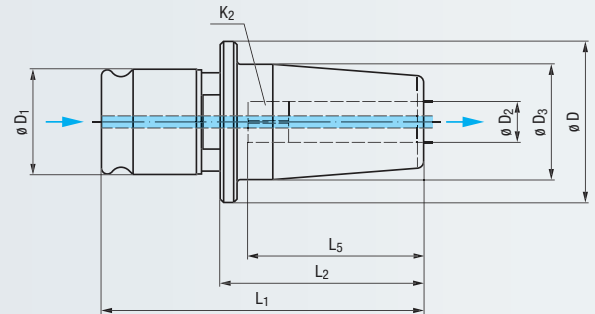
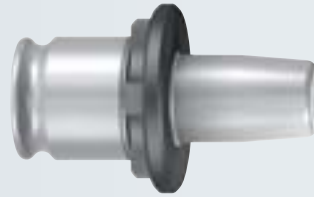
- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info

Type		inch				EDP Number	
		ø D	ø D <sub>1</sub>	ø D <sub>2</sub>	L <sub>2</sub>		
EM 01/00-R	EM 00	1.1811	0.7480	0.5118	0.4331	F0891000	★
EM 03/00-R	EM 00	1.8898	1.2205	0.5118	0.4724	F0893000	★
EM 03/01-R	EM 01	1.8898	1.2205	0.7480	0.4724	F0893001	★
EM 04/01-R	EM 01	2.7559	1.8898	0.7480	0.5118	F0894001	★
EM 04/03-R	EM 03	2.7559	1.8898	1.2205	0.6693	F0894003	★
EM 05/03-R	EM 03	3.6220	2.3622	1.2205	0.9449	F0895003	★
EM 05/04-R	EM 04	3.6220	2.3622	1.8898	1.0630	F0895004	★

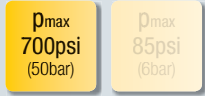
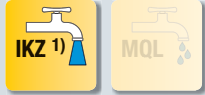


### EM-S Metric DIN

For thermic shrinking of carbide tools with h6 shank tolerance

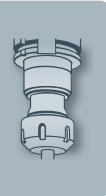


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info

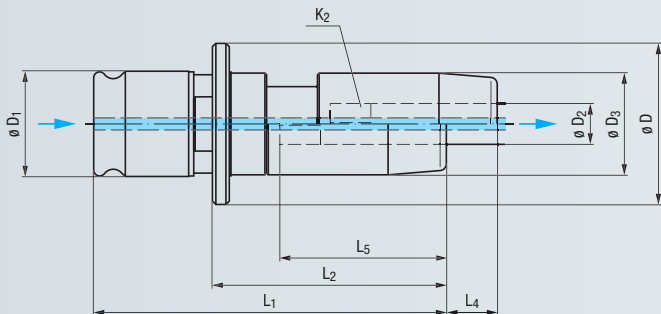
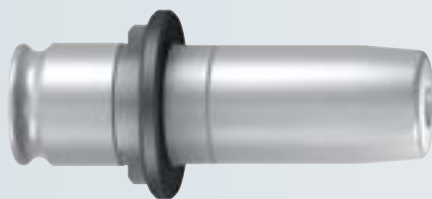


Type		EM01-S/DIN			EM03-S/DIN													
Solid carbide		M4.5 - M12			M4.5 - M20													
Quick-Change Adapter Dimensions (mm)	$\phi D$	30			48													
	$\phi D_1$	19			31													
	$\phi D_3$	22			22	34												
	$L_1$	61.5			75	95												
	$L_2$	40			40	60												
$\phi D_2$	$K_2$			EDP Number	$L_5$		EDP Number	$L_5$		EDP Number	$L_5$							
6	4.9	M4.5 - M6	M8	<b>F6561106</b>	26	31	<b>F6563106</b>	26	31	<b>F6563111</b>								
7	5.5	M7	M9 - M10	<b>F6561107</b>	26	31	<b>F6563107</b>	26	31	<b>F6563112</b>	41	46	*					
8	6.2	M8	M11	<b>F6561108</b>	27	32	<b>F6563108</b>	27	32	<b>F6563113</b>	43	48	*					
9	7	M9	M12	<b>F6561109</b>	28	33	<b>F6563109</b>	28	33	<b>F6563114</b>	44	49	*					
10	8	M10		<b>F6561110</b>	29	34	<b>F6563110</b>	29	34									
11	9		M14															
12	9		M16															
14	11		M18															
16	12		M20															

1) If used with taps / roll form taps with internal coolant supply



For thermic shrinking of carbide tools with h6 shank tolerance



**EM-LS**  
Metric  
DIN



$p_{max}$   
700psi  
(50bar)

$p_{max}$   
85psi  
(6bar)

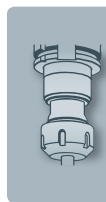


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info

Type	EM01-LS/DIN	EM03-LS/DIN		
Solid carbide	M4.5 - M12	M4.5 - M20		
<b>Quick-Change Adapter Dimensions (mm)</b>	$\varnothing D$	30	48	
	$\varnothing D_1$	19	31	
	$\varnothing D_3$	22	30	
	$L_1$	69	104	
	$L_2$	49	69	
	$L_4$	10	15	

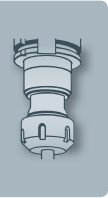
$\varnothing D_2$	mm $K_2$			EDP Number	$L_5$	*	EDP Number	$L_5$	*				
6	4.9	M4.5 - M6	M8	<b>F6581106</b>	31	*							
7	5.5	M7	M9 - M10	<b>F6581107</b>	31	*							
8	6.2	M8	M11	<b>F6581108</b>	32	*							
9	7	M9	M12	<b>F6581109</b>	33	*							
10	8	M10		<b>F6581110</b>	34	*	<b>F6583110</b>	34	*				
11	9		M14				<b>F6583111</b>	46	*				
12	9		M16				<b>F6583112</b>	46	*				
14	11		M18				<b>F6583113</b>	48	*				
16	12		M20				<b>F6583114</b>	49	*				

1) If used with taps / roll form taps with internal coolant supply





- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM**
- Accessories
- Tech. Info



Product  
FinderSoft-  
synchro

KSN

MQL

SFM

SWITCH-  
MASTER

GRN-NC

SPEED-  
SYNCHRO

HF

EM

Accessories

Tech. Info

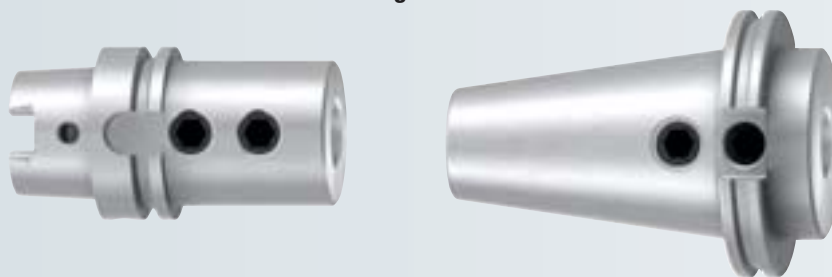
## Accessories for Tap Holders and Tapping Attachments



- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



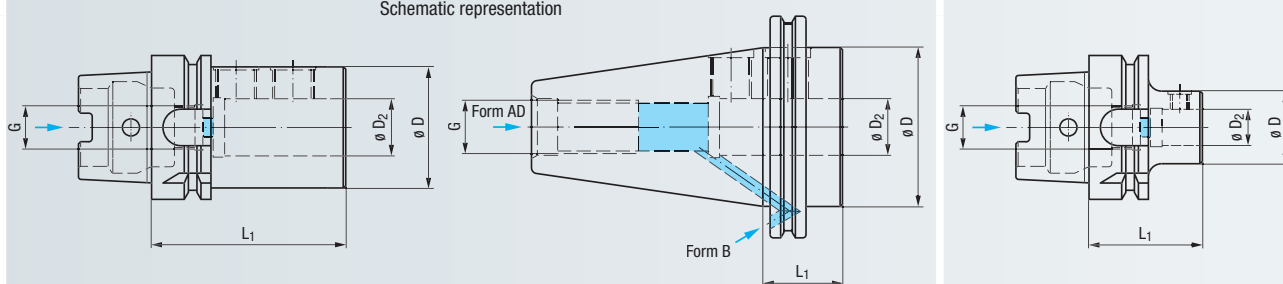
With shank adaption according to DIN 1835 B



With shank adaption according to ABS® Shank



Schematic representation



Type	Form	Shank Size	mm				EDP Number	
			ø D <sub>2</sub>	ø D	G	L <sub>1</sub>		
DIN 69871 1)	AD	SK 40	25	45	M16	35	F330006.01	★
		SK 50	25	70	M24	35	F330006.02	★
		SK 50	32	70	M24	35	F330006.05	★
	B	SK 40	25	45	M16	35	F330006.03	★
		SK 50	25	70	M24	35	F330006.04	★
		SK 50	32	70	M24	35	F330006.06	★
DIN 2080	AD	SK 30	20	36	M12	34	F330005.03	★
		SK 40	25	44	M16	22	F330005.01	★
		SK 50	25	70	M24	16	F330005.02	★
		SK 50	32	70	M24	16	F330005.04	★
ASME B5.50 Metr.	AD	SK 40	25	45	M16	35	F330007.01	
		SK 50	25	70	M24	35	F330007.02	
		SK 50	32	70	M24	35	F330007.06	
ASME B5.50 UNC	AD	CAT 40	25	44.5	5/8 - 11	35	F330007.03	●
		CAT 50	25	70	1 - 8	35	F330007.04	●
		CAT 50	32	70	1 - 8	35	F330007.05	●
JIS B 6339 (MAS 403 BT)	AD	BT 30	20	36	M12	35	F330008.04	★
		BT 40	25	45	M16	35	F330008.01	★
		BT 50	25	70	M24	44	F330008.02	★
		BT 50	32	70	M24	44	F330008.03	★
DIN 69893 A 1) 2)		HSK-A40	20	52	M12 x 1	75	F33000C.02	★
		HSK-A40	25	65	M12 x 1	105	F33000C.03	★
		HSK-A50	20	52	M16 x 1	80	F33000C.04	★
		HSK-A50	25	65	M16 x 1	107	F33000C.05	★
		HSK-A50	32	77	M16 x 1	114	F33000C.06	★
		HSK-A63	25	53	M18 x 1	85	F33000C.07	★
		HSK-A63	32	72	M18 x 1	110	F33000C.08	★
		HSK-A80	25	65	M20 x 1.5	90	F33000C.09	★
		HSK-A80	32	72	M20 x 1.5	110	F33000C.10	★
		HSK-A100	25	65	M24 x 1.5	100	F33000C.11	★
		HSK-A100	32	72	M24 x 1.5	96	F33000C.12	★
		HSK-A63	ABS 32	32	M18 x 1	50	F33000C.48	★
HSK-A100	ABS 32	32	M24 x 1.5	60	F33000C.50	★		

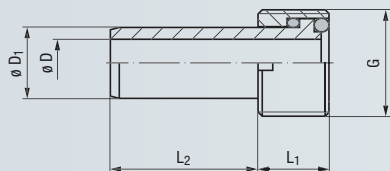
1) With bore for data chip according to DIN 69873

Further designs upon request

2) Coolant tubes and wrenches see page 413, please order separately

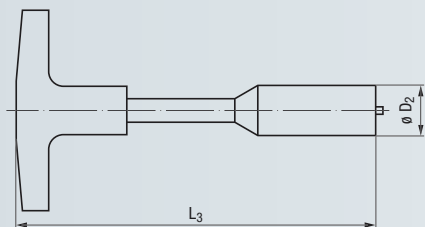
The locking screw is included in the delivery

## Coolant tubes DIN 69895



For Shank Size	$\varnothing D$	$\varnothing D_1$	$L_1$	$L_2$	G	EDP Number	
HSK-A40	5	8	8	21.5	M12 x 1	F330049.02	★
HSK-A50	6.4	10	10	23	M16 x 1	F330049.03	★
HSK-A63	8	12	12	24.5	M18 x 1	F330049.04	★
HSK-A80	10	14	14	26	M20 x 1.5	F330049.05	★
HSK-A100	12	16	16	28	M24 x 1.5	F330049.06	★

## Assembly wrenches



For Shank Size	$\varnothing D_2$	$L_3$	EDP Number	
HSK-A40	11	111	F330099.02	★
HSK-A50	15	120	F330099.03	★
HSK-A63	17	122	F330099.04	★
HSK-A80	18.5	126	F330099.05	★
HSK-A100	22	141	F330099.06	★

## Use of coolant tubes with hollow taper shanks according to DIN 69893 A

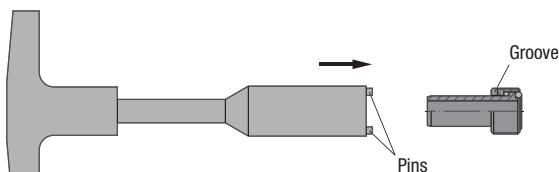
The coolant tube is necessary for connecting the internal coolant supply of the machine spindle with the hollow taper shank of the tap holder.

Please note: We recommend screwing the coolant tube into the hollow taper shank even when tap holders without internal coolant supply are used (e.g. type KSN); this will help to prevent damage to the hollow taper shank clamping system in case of unintentional switching on of the internal coolant supply.

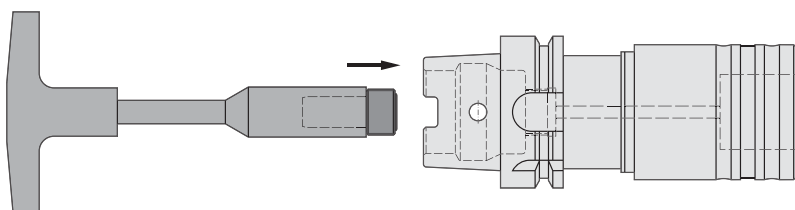
## Assembly of the coolant tube in the hollow taper (HSK) shank

1. Put assembly wrench on the coolant tube.

**Important:** Watch the position of the pins against the grooves!



2. Screw coolant tube into the shank.

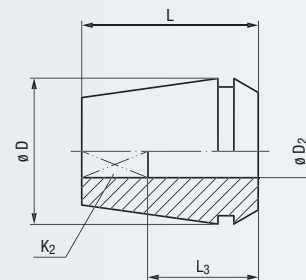


With square drive

### ER-GB

### Metric

DIN ISO 15488 (DIN 6499)



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM

IKZ

MQL

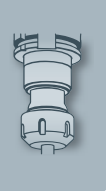
$p_{max}$   
700psi  
(50bar)

$p_{max}$   
1400psi  
(100bar)

- Accessories
- Tech. Info

Type		ER 11 GB		ER 16 GB		ER 20 GB						
		M2 - M8		M4 - M12		M4 - M12						
Collet Dimensions (mm)		ø D		L								
		11		16		20						
		18		27.5		31.5						
DIN				EDP Number		L <sub>3</sub>						
mm												
ø D <sub>2</sub>	K <sub>2</sub>											
2.8	2.1	M2 - M2.6	M4	F0942011.2.8	12	●						
3.5	2.7	M3	M4.5 - M5	F0942011.3.5	14	●						
4	3	M3.5	M5.5	F0942011.4	14	●						
4.5	3.4	M4	M6	F0942011.4.5	14	●	F0942016.4.5	15	●	F0942020.4.5	15	●
6	4.9	M4.5 - M6	M8	F0942011.6	14	●	F0942016.6	18	●	F0942020.6	18	●
7	5.5	M7	M9 - M10				F0942016.7	18	●	F0942020.7	18	●
8	6.2	M8	M11				F0942016.8	22	●	F0942020.8	22	●
9	7	M9	M12				F0942016.9	22	●	F0942020.9	22	●
10	8	M10								F0942020.10	25	●

Type		ER 25 GB		ER 32 GB		ER 40 GB		ER 50 GB					
		M4 - M20		M4 - M20		M9 - M30		M30 - M42					
Collet Dimensions (mm)		ø D		L									
		25		32		40		51					
		34		40		46		60					
DIN				EDP Number		L <sub>3</sub>							
mm													
ø D <sub>2</sub>	K <sub>2</sub>												
4.5	3.4	M4	M6	F0942025.4.5	15	●	F0942032.4.5	15	●				
6	4.9	M4.5 - M6	M8	F0942025.6	18	●	F0942032.6	18	●				
7	5.5	M7	M9 - M10	F0942025.7	18	●	F0942032.7	18	●				
8	6.2	M8	M11	F0942025.8	22	●	F0942032.8	22	●				
9	7	M9	M12	F0942025.9	22	●	F0942032.9	22	●	F0942040.9	22	●	
10	8	M10		F0942025.10	25	●	F0942032.10	25	●	F0942040.10	25	●	
11	9		M14	F0942025.11	25	●	F0942032.11	25	●	F0942040.11	25	●	
12	9		M16	F0942025.12	25	●	F0942032.12	25	●	F0942040.12	25	●	
14	11		M18	F0942025.14	25	●	F0942032.14	25	●	F0942040.14	25	●	
16	12		M20	F0942025.16	25	●	F0942032.16	25	●	F0942040.16	25	●	
18	14.5		M22 - M24							F0942040.18	25	●	
20	16		M27							F0942040.20	28	●	
22	18		M30							F0942040.22	28	●	
25	20		M33								F0942050.22	41	●
28	22		M36								F0942050.25	41	●
32	24		M39 - M42								F0942050.28	41	●
											F0942050.32	41	●





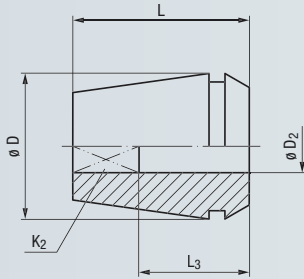
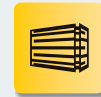
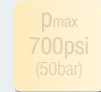
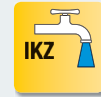
With square drive



**ER-GB**

Inch

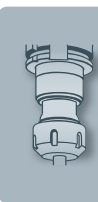
DIN ISO 15488 (DIN 6499)



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

Type	ER 11 GB	ER 20 GB	ER 32 GB	ER 40 GB	ER 50 GB
	No.0 - No.6	No.8 - 1/2	1/4 - 3/4	1/4 - 1	1 - 1 1/2
<b>Collet</b>	$\phi D$ 0.433	0.787	1.260	1.575	2.008
<b>Dimensions (inch)</b>	L 0.709	1.240	1.575	1.811	2.362

ASME		inch				ER 11 GB		ER 20 GB		ER 32 GB		ER 40 GB		ER 50 GB			
$\phi D_2$	$K_2$	EDP Number	$L_3$			EDP Number	$L_3$	EDP Number	$L_3$	EDP Number	$L_3$	EDP Number	$L_3$				
0.141	0.110	No.0-No.6				<b>F0942011.3.58</b>	0.55										
0.168	0.131	No.8				<b>F0942020.4.27</b>	0.71	●									
0.194	0.152	No.10				<b>F0942020.4.93</b>	0.71	●									
0.220	0.165	No.12				<b>F0942020.5.59</b>	0.71	●									
0.255	0.191	1/4				<b>F0942020.6.48</b>	0.71	●	<b>F0942032.6.48</b>	0.71	●	<b>F0942040.6.48</b>	0.71	●			
0.3125	0.234	1/16 NPT				<b>F0942020.7.94</b>	0.87	●	<b>F0942032.7.94</b>	0.87	●	<b>F0942040.7.94</b>	0.87	●			
0.318	0.238	5/16				<b>F0942020.8.08</b>	0.87	●	<b>F0942032.8.08</b>	0.87	●	<b>F0942040.8.08</b>	0.87	●			
0.323	0.242		7/16			<b>F0942020.8.20</b>	0.87	●	<b>F0942032.8.20</b>	0.87	●	<b>F0942040.8.20</b>	0.87	●			
0.367	0.275		1/2			<b>F0942020.9.32</b>	0.87	●	<b>F0942032.9.32</b>	0.87	●	<b>F0942040.9.32</b>	0.87	●			
0.381	0.286	3/8				<b>F0942020.9.68</b>	0.87	●	<b>F0942032.9.68</b>	0.87	●	<b>F0942040.9.68</b>	0.87	●			
0.429	0.322		9/16						<b>F0942032.10.90</b>	0.98		<b>F0942040.10.90</b>	0.98				
0.4375	0.328	1/8 NPT							<b>F0942032.11.11</b>	0.98		<b>F0942040.11.11</b>	0.98				
0.480	0.360		5/8						<b>F0942032.12.19</b>	0.98		<b>F0942040.12.19</b>	0.98				
0.542	0.406		11/16						<b>F0942032.13.77</b>	0.98		<b>F0942040.13.77</b>	0.98				
0.5625	0.421	1/4 NPT							<b>F0942032.14.29</b>	0.98		<b>F0942040.14.29</b>	0.98				
0.590	0.442		3/4						<b>F0942032.14.99</b>	0.98		<b>F0942040.14.99</b>	0.98				
0.697	0.523		7/8									<b>F0942040.17.70</b>	0.98				
0.800	0.600		1									<b>F0942040.20.32</b>	1.10	●	<b>F0942050.20.32</b>	1.61	●
0.896	0.672		1 1/8												<b>F0942050.22.75</b>	1.61	●
1.021	0.766		1 1/4												<b>F0942050.25.93</b>	1.61	●
1.108	0.831		1 3/8												<b>F0942050.28.14</b>	1.61	●
1.233	0.925		1 1/2												<b>F0942050.31.31</b>	1.61	●

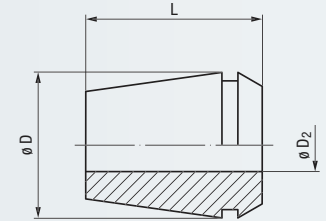


Without square drive

## ER

### Metric / Inch

DIN ISO 15488 (DIN 6499)

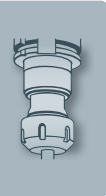


$p_{max}$ 700psi (50bar)	$p_{max}$ 1400psi (100bar)

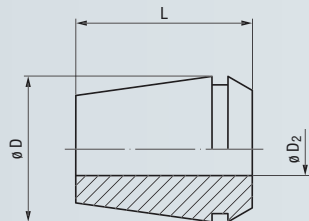
- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM

- Accessories
- Tech. Info

Type		ER 8	ER 11	ER 16	ER 20	
		1 - 4.5 mm 0.0394 - 0.1772	1.5 - 7 mm 0.0591 - 0.2756	1 - 10 mm 0.0394 - 0.3937	3 - 11 mm 0.1181 - 0.4331	
<b>Collet</b>	$\varnothing D$	8 mm (0.315)	11 mm (0.433)	16 mm (0.630)	20 mm (0.787)	
<b>Dimensions</b>	L	13.6 mm (0.535)	18 mm (0.709)	27.5 mm (1.083)	31.5 mm (1.240)	
$\varnothing D_2$		EDP Number	EDP Number	EDP Number	EDP Number	
mm	inch					
1.5	- 1	F0943008.1.5	•			
2	- 1.5	F0943008.2	•	F0943011.2	•	
2.5	- 2	F0943008.2.5	•	F0943011.2.5	•	
3	- 2.5	F0943008.3	•	F0943011.3	•	
3	- 2			F0943016.3	•	
3.5	- 3	F0943008.3.5	•	F0943011.3.5	•	
4	- 3.5	F0943008.4	•	F0943011.4	•	
4	- 3			F0943016.4	•	
4.5	- 4	F0943008.4.5	•	F0943011.4.5	•	
5	- 4.5			F0943011.5	•	
5	- 4			F0943016.5	•	
5	- 4			F0943016.5	•	
6	- 5.5			F0943011.6	•	
6	- 5			F0943016.6	•	
6	- 5			F0943016.6	•	
6.5	- 6			F0943011.6.5	•	
7	- 6.5			F0943011.7	•	
7	- 6			F0943016.7	•	
9	- 8			F0943016.9	•	
10	- 9			F0943016.10	•	
11	- 10				F0943020.11	•
12	- 11					
14	- 13					
16	- 15					
18	- 17					
20	- 19					
22	- 21					
36	- 34					



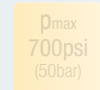
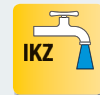
Without square drive



**ER**

**Metric / Inch**

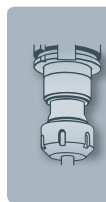
DIN ISO 15488 (DIN 6499)



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM

Accessories  
Tech. Info

Type		ER 32	ER 40	ER 50		
		3 - 18 mm 0.1181 - 0.7087	11 - 22 mm 0.4331 - 0.8661	34 - 36 mm 1.3386 - 1.4173		
Collet Dimensions	$\varnothing D$	32 mm (1.260)	40 mm (1.575)	50 mm (1.969)		
	L	40 mm (1.575)	46 mm (1.811)	60 mm (2.362)		
$\varnothing D_2$						
mm	inch	EDP Number	EDP Number	EDP Number		
1.5	- 1					
2	- 1.5					
2.5	- 2					
3	- 2.5					
3	- 2					
3.5	- 3					
4	- 3.5					
4	- 3	F0943032.4	●			
4.5	- 4					
5	- 4.5					
5	- 4	F0943032.5	●			
6	- 5.5					
6	- 5	F0943032.6	●			
6.5	- 6					
7	- 6.5					
7	- 6	F0943032.7	●			
9	- 8	F0943032.9	●			
10	- 9					
11	- 10	F0943032.11	●			
12	- 11	F0943032.12	●	F0943040.12	●	
14	- 13	F0943032.14	●	F0943040.14	●	
16	- 15	F0943032.16	●	F0943040.16	●	
18	- 17	F0943032.18	●	F0943040.18	●	
20	- 19			F0943040.20	●	
22	- 21			F0943040.22	●	
36	- 34			F0943050.36	●	

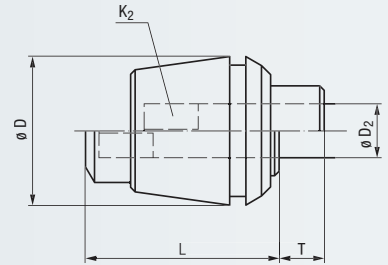


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

# PCM ET1

## Metric

With square drive and length compensation on tension, not suitable for internal coolant supply



$p_{max}$   
700psi  
(50bar)

$p_{max}$   
1400psi  
(100bar)

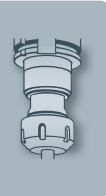
Type	PCM ET1-12	PCM ET1-20	PCM ET1-32	PCM ET1-40
	M2 - M4	M2 - M10	M4 - M16	M4.5 - M20
Collet Dimensions (mm)	T	5.5	7	10
	ø D	11.5	21	33
	L	21.5	31	43

DIN		mm		EDP Number		EDP Number		EDP Number		EDP Number	
ø D <sub>2</sub>	K <sub>2</sub>										
2.8	2.1	M2 - M2.6	M4	F0945011.2.8	*	F0945020.2.8	*				
3.5	2.7	M3	M4.5 - M5			F0945020.3.5	*				
4	3	M3.5	M5.5			F0945020.4	*				
4.5	3.4	M4	M6			F0945020.4.5	*	F0945032.4.5	*		
6	4.9	M4.5 - M6	M8			F0945020.6	*	F0945032.6	*	F0945040.6	*
7	5.5	M7	M9 - M10			F0945020.7	*	F0945032.7	*	F0945040.7	*
8	6.2	M8	M11					F0945032.8	*	F0945040.8	*
9	7	M9	M12					F0945032.9	*	F0945040.9	*
10	8	M10						F0945032.10	*	F0945040.10	*
11	9		M14					F0945032.11	*	F0945040.11	*
12	9		M16					F0945032.12	*	F0945040.12	*
14	11		M18							F0945040.14	*
16	12		M20							F0945040.16	*

The threading tool is clamped by means of 4 worm screws on the square

Further designs upon request

Due to the length compensation, sealing disks cannot be used in the clamping nut



With square drive and length compensation on tension,  
not suitable for internal coolant supply



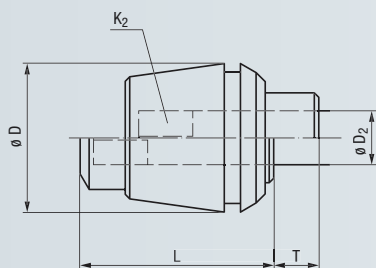
# PCM ET1

Inch



$p_{max}$   
700psi  
(50bar)

$p_{max}$   
1400psi  
(100bar)



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

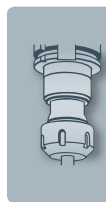
Type	PCM ET1-20	PCM ET1-32	PCM ET1-40
	1/4	1/4 - 5/8	1/4 - 7/8
Collet Dimensions (inch)	T	0.276	0.394
	$\varnothing D$	0.827	1.299
	L	1.220	1.693

ASME				EDP Number		EDP Number		EDP Number	
$\varnothing D_2$	$K_2$				*		*		*
0.255	0.191	1/4		<b>F0945020.6.48</b>	*	<b>F0945032.6.48</b>	*	<b>F0945040.6.48</b>	*
0.318	0.238	5/16				<b>F0945032.8.08</b>	*	<b>F0945040.8.08</b>	*
0.381	0.286	3/8				<b>F0945032.9.68</b>	*	<b>F0945040.9.68</b>	*
0.323	0.242		7/16			<b>F0945032.8.20</b>	*	<b>F0945040.8.20</b>	*
0.367	0.275		1/2			<b>F0945032.9.32</b>	*	<b>F0945040.9.32</b>	*
0.429	0.322		9/16			<b>F0945032.10.90</b>	*	<b>F0945040.10.90</b>	*
0.480	0.360		5/8			<b>F0945032.12.19</b>	*	<b>F0945040.12.19</b>	*
0.590	0.442		3/4					<b>F0945040.14.99</b>	*
0.697	0.523		7/8					<b>F0945040.17.70</b>	*
0.800	0.600		1						
0.896	0.672		1 1/8						
1.021	0.766		1 1/4						
1.108	0.831		1 3/8						
1.233	0.925		1 1/2						
1.430	1.072		1 3/4						

The threading tool is clamped by means of 4 worm screws on the square

Further designs upon request

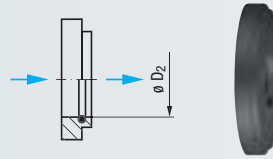
Due to the length compensation, sealing disks cannot be used in the clamping nut



### DS/ER

Metric / Inch

DIN / ASME

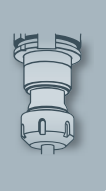


$p_{max}$   
1400psi  
(100bar)

- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

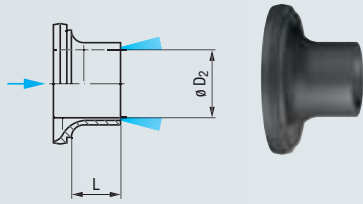
Type				DS/ER 16	DS/ER 20	DS/ER 25	DS/ER 32	DS/ER 40	DS/ER 50	
DIN				EDP Number	EDP Number	EDP Number	EDP Number	EDP Number	EDP Number	
mm										
$\varnothing D_2$	$K_2$									
4	3	M3.5	M5.5	F0941516.4	●					
4.5	3.4	M4	M6	F0941516.4.5	●	F0941520.4.5	●	F0941525.4.5	●	
6	4.9	M4.5 - M6	M8	F0941516.6	●	F0941520.6	●	F0941525.6	●	
7	5.5	M7	M9 - M10	F0941516.7	●	F0941520.7	●	F0941525.7	●	
8	6.2	M8	M11	F0941516.8	●	F0941520.8	●	F0941525.8	●	
9	7	M9	M12	F0941516.9	●	F0941520.9	●	F0941525.9	●	
10	8	M10		F0941516.10	●	F0941520.10	●	F0941525.10	●	
11	9		M14			F0941525.11	●	F0941532.11	●	
12	9		M16			F0941525.12	●	F0941532.12	●	
14	11		M18			F0941525.14	●	F0941532.14	●	
16	12		M20			F0941525.16	●	F0941532.16	●	
18	14.5		M22 - M24					F0941540.18	●	
20	16		M27					F0941540.20	●	
22	18		M30					F0941540.22	●	
25	20		M33						F0941550.22	★
28	22		M36						F0941550.25	★
32	24		M39 - M42						F0941550.28	★
36	29		M45 - M48						F0941550.32	★
									F0941550.36	★

Type				DS/ER 16	DS/ER 20	DS/ER 25	DS/ER 32	DS/ER 40	
ASME				EDP Number	EDP Number	EDP Number	EDP Number	EDP Number	
inch									
$\varnothing D_2$	$K_2$								
0.141	0.110	No. 1 - 6		F0941516.4	●				
0.168	0.131	No. 8		F0941516.4.5	●	F0941520.4.5	●	F0941525.4.5	●
0.194	0.152	No. 10		F0941516.5	●	F0941520.5	●	F0941525.5	●
0.220	0.165	No. 12		F0941516.6	●	F0941520.6	●	F0941525.6	●
0.255	0.191	1/4		F0941516.6.5	●	F0941520.6.5	●	F0941525.6.5	●
0.3125	0.234	1/16 NPT		F0941516.8	●	F0941520.8	●	F0941525.8	●
0.318	0.238	5/16		F0941516.8.5	●	F0941520.8.5	●	F0941525.8.5	●
0.323	0.242		7/16	F0941516.8.5	●	F0941520.8.5	●	F0941525.8.5	●
0.367	0.275		1/2	F0941516.9.5	●	F0941520.9.5	●	F0941525.9.5	●
0.381	0.286	3/8		F0941516.10	●	F0941520.10	●	F0941525.10	●
0.429	0.322		9/16			F0941525.11	●	F0941532.11	●
0.4375	0.328	1/8 NPT				F0941525.11.5	●	F0941532.11.5	●
0.480	0.360		5/8			F0941525.12.5	●	F0941532.12.5	●
0.5625	0.421	1/4 NPT				F0941525.14.5	●	F0941532.14.5	●
0.590	0.442		3/4			F0941525.15	●	F0941532.15	●
0.6875			1/2 NPT					F0941540.15	●
0.697	0.523		7/8					F0941540.17.5	●
0.700		3/8 NPT						F0941540.18	●
0.800	0.600		1					F0941540.18	●
								F0941540.20.5	●





# KS/ER

## Metric



$p_{max}$   
1400psi  
(100bar)

Type				KS/ER 16			KS/ER 20			DS/ER 32		
DIN				EDP Number	L		EDP Number	L		EDP Number	L	
$\varnothing D_2$	$K_2$	mm										
4	3	M3.5	M5.5	F0941716.4	11	★						
6	4.9	M4.5 - M6	M8	F0941716.6	11	★	F0941720.6	11	★	F0941732.6	11	★
7	5.5	M7	M9 - M10	F0941716.7	11	★	F0941720.7	11	★	F0941732.7	11	★
8	6.2	M8	M11	F0941716.8	11	★	F0941720.8	11	★	F0941732.8	11	★
9	7	M9	M12	F0941716.9	11	★	F0941720.9	11	★	F0941732.9	11	★
10	8	M10		F0941716.10	2	★	F0941720.10	11	★	F0941732.10	11	★
11	9		M14							F0941732.11	11	★
12	9		M16							F0941732.12	11	★
14	11		M18							F0941732.14	11	★
16	12		M20							F0941732.16	11	★

Product Finder

Soft-synchro

KSN

MQL

SFM

SWITCH-MASTER

GRN-NC

SPEED-SYNCHRO

HF

EM

Accessories

Tech. Info



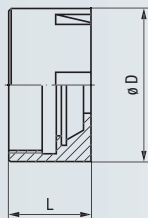
- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## Hi-Q/ERM Without sealing

Without sealing



$p_{max}$   
1400psi  
(100bar)

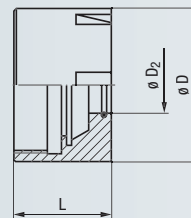


## Hi-Q/ERMC With integrated sealing



With integrated sealing



$p_{max}$   
1400psi  
(100bar)



Type		Hi-Q/ERM 8	Hi-Q/ERM 11
Collet	$\varnothing D$	12	16
Dimensions (mm)	L	10.8	12
	<b>For Collets</b>	<b>EDP Number</b>	<b>EDP Number</b>
	ER 8	<b>F0940308</b> *	
	ER 11 (GB)		<b>F0940311</b> *

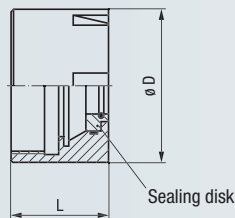
Type				Hi-Q/ERMC 11
Collet	$\varnothing D$			16
Dimensions (mm)	L			14.6
<b>DIN</b>				
	mm			
	$\varnothing D_2$ K <sub>2</sub>			<b>For Collets</b>
	6 4.9	M4.5 - M6	M8	ER 11 (GB)
	7 5.5	M7	M9 - M10	ER 11 (GB)
				<b>EDP Number</b>
				<b>F0943511.6</b> *
				<b>F0943511.7</b> *

## Hi-Q/ERMC For sealing disks

For sealing disks

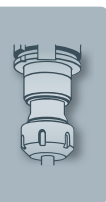


$p_{max}$   
1400psi  
(100bar)



Type		Hi-Q/ERMC 16	Hi-Q/ERMC 20	Hi-Q/ERMC 25
Collet	$\varnothing D$	22	28	35
Dimensions (mm)	L	22	24	25
	<b>For Collets</b>	<b>Sealing Disks</b>	<b>EDP Number</b>	<b>EDP Number</b>
	ER 16 (GB)	DS/ER 16	<b>F0943516</b> *	
	ER 20 (GB)	DS/ER 20	<b>F0943520</b> *	
	ER 25 (GB)	DS/ER 25		<b>F0943525</b> *

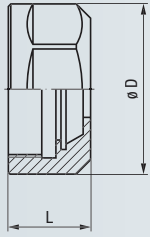
Sealing disks are not included in the delivery, please order separately (see page 420)





Without sealing

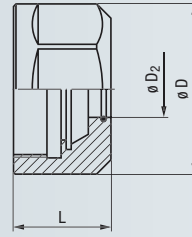
**Hi-Q/ER**



$p_{max}$   
1400psi  
(100bar)

With integrated sealing

**Hi-Q/ERC**



$p_{max}$   
1400psi  
(100bar)

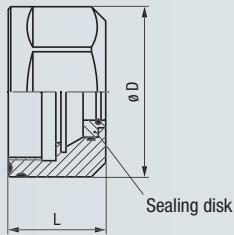
Type	Hi-Q/ER 11	
Collet	$\varnothing D$	19
Dimensions (mm)	L	11.3
For Collets	EDP Number	
ER 11 (GB)	<b>F0940911</b>	*

Type	Hi-Q/ERC 11	
Collet	$\varnothing D$	19
Dimensions (mm)	L	14.6
DIN		
mm		
$\varnothing D_2$   $K_2$		
6   4.9	M4.5 - M6	M8
7   5.5	M7	M9 - M10
For Collets	EDP Number	
ER 11 (GB)	<b>F0940711.6</b>	*
ER 11 (GB)	<b>F0940711.7</b>	*

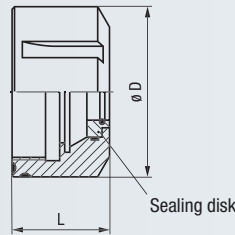
For sealing disks

**Hi-Q/ERC**

Hi-Q/ERC 16-20



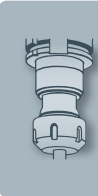
Hi-Q/ERC 25-40



$p_{max}$   
1400psi  
(100bar)

Type	Hi-Q/ERC 16		Hi-Q/ERC 20		Hi-Q/ERC 25		Hi-Q/ERC 32		Hi-Q/ERC 40	
Collet	$\varnothing D$	28	34	42	50	63				
Dimensions (mm)	L	22.5	24	25	27.5	30.5				
For Collets	Sealing Disks	EDP Number	EDP Number	EDP Number	EDP Number	EDP Number	EDP Number	EDP Number	EDP Number	
ER 16 (GB)	DS/ER 16	<b>F0940716</b>	*	<b>F0940720</b>	*	<b>F0940725</b>	*	<b>F0940732</b>	*	<b>F0940740</b>
ER 20 (GB)	DS/ER 20									
ER 25 (GB)	DS/ER 25									
ER 32 (GB)	DS/ER 32									
ER 40 (GB)	DS/ER 40									

Sealing disks are not included in the delivery, please order separately (see page 420)

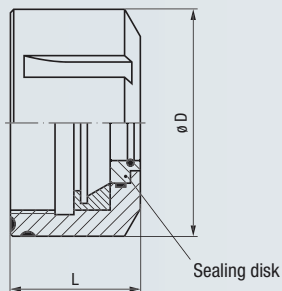


For sealing disks

# Hi-Q/ERBC



$p_{max}$   
1400psi  
(100bar)



Type		Hi-Q/ERBC 50 AF			
Collet	$\varnothing D$	77.7			
Dimensions (mm)	L	42.5			
For Collets	Sealing Disks	EDP Number	EDP Number	EDP Number	EDP Number
ER 50 (GB)	DS/ER 50	F0941650	*		

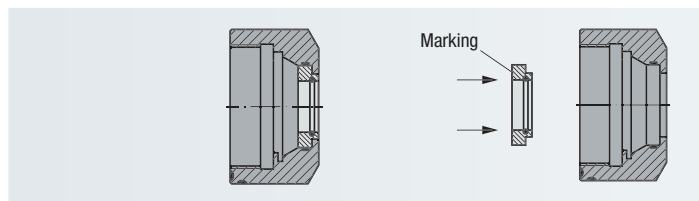
Sealing disks are not included in the delivery, please order separately (see page 420)

### Assembly of Sealing Disk, Collet and Tool

1. Assembly of sealing disk with collets type ER 16 (GB) up to ER 50 (GB):

Insert the sealing disk into the clamping nut as shown in the illustration, and push it forward until you can clearly hear it engaging. After that, the sealing disk is flush with the clamping nut.

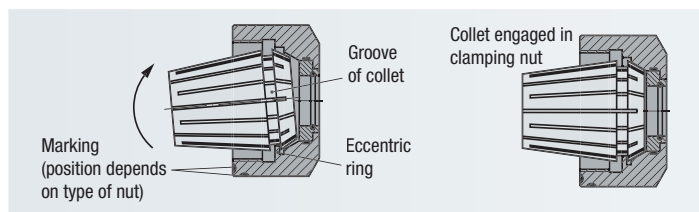
For collets type ER11 (GB) you can use clamping nuts with integrated sealing system – a separate sealing disk is not needed then. The clamping nut must be selected in accordance with the clamping diameter used.



2. Assembly of clamping nuts:

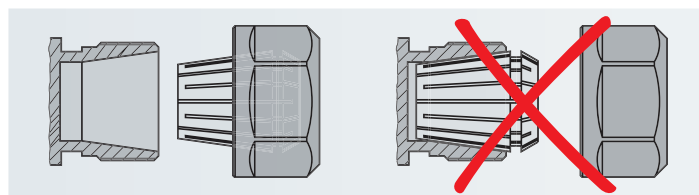
Insert the collet into the clamping nut, then tilt it. The groove of the collet must engage in the eccentric ring of the clamping nut at the marked position.

Now, tilt the collet in the opposite direction until you clearly hear it engaging.



3. Screw the clamping nut with the engaged collet onto the thread of the holder.

**Important:** Only screw on clamping nuts with correctly engaged collet!



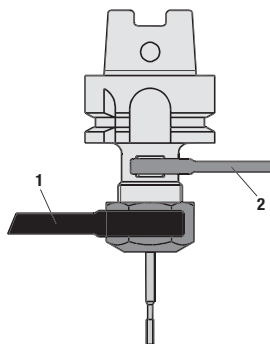
4. Insert tool.

**Important:** If you use a collet with integrated square, make sure to turn the tool around until it is in a position that allows it to be pushed into the square seat of the collet.

5. Tighten the clamping nut with the wrench.

Observe the max. torque values in the table.  
**Important:** In order to avoid damage to the holder, please counter with open-ended spanner 2 while tightening the clamping nut with wrench 1.

For suitable tool sets, see pages 425 - 426.



Type	Recommended Tightening Torque		Type	Recommended Tightening Torque	
	ft lbs	Nm		ft lbs	Nm
Hi-Q/ERM 8	4	6	Hi-Q/ERC 11	10	14
Hi-Q/ERM 11	9	12	Hi-Q/ERC 16	29	40
Hi-Q/ER 11	10	14	Hi-Q/ERC 20	23	32
Hi-Q/ER 50	177	240	Hi-Q/ERC 25	59	80
Hi-Q/ERMC 11	9	12	Hi-Q/ERC 32	66	90
Hi-Q/ERMC 16	17	24	Hi-Q/ERC 40	132	180
Hi-Q/ERMC 20	20	28	Hi-Q/ERCB 50 AF	221	300
Hi-Q/ERMC 25	23	32			

The indicated values apply to collets type ER-GB. The maximum tightening torque must not exceed the recommended value by more than 25%. An excessive tightening torque can result in permanent deformation of the collet holder. For the setting of the correct torque, we recommend using a torque wrench, see page 427.

Sets of clamping wrenches

**Softsynchro®**

Softsynchro® Micro, Softsynchro® 0



Softsynchro® 1



Softsynchro® 3, Softsynchro® 4



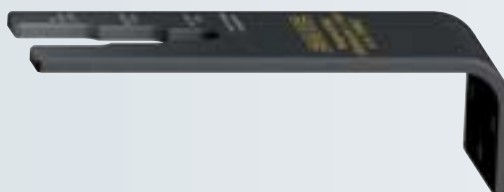
Softsynchro® 5



For Collet Holders	Collet Size	Components	EDP Number	
Softsynchro® Micro	ER 8	E8M / SW8	F315098.03	★
Softsynchro® 0	ER 11 (GB)	E11M / SW14	F315098.02	★
Softsynchro® 1	ER 20 (GB)	SW30 / SW19	F315198.02	★
Softsynchro® 1 for driven tools	ER 16 (GB)	SW25 / SW17	F315198.03	★
Softsynchro® 1, SPEEDSYNCHRO®	ER 16 (GB)	E16M / SW17	F350198.01	★
Softsynchro® 3	ER 32 (GB)	E32 / SW32	F315398.01	★
Softsynchro® 4	ER 40 (GB)	E40 / SW41	F315498.01	★
Softsynchro® 5	ER 50 (GB)	E50	F315598.02	★

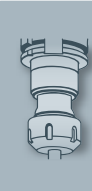
Assembly device

**Softsynchro®**



For Collet Holders	EDP Number	
Softsynchro® 1 - Softsynchro® 4	F315199.02	★

- Product Finder
- Softsynchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEEDSYNCHRO
- HF
- EM
- Accessories
- Tech. Info



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

### KSN/HD/ER

Sets of clamping wrenches

KSN1/HD/ER



KSN3/HD/ER



For Collet Holders	Components	EDP Number	
KSN 1/HD/ER	E20M / SW24	F323198.01	★
KSN 3/HD/ER	E32 / SW34	F323398.01	★

### EM-L/ER/IKZ

Sets of clamping wrenches

EM 00-L/ER/IKZ - EM 03-L/ER/IKZ



For Collet Holders	Components	EDP Number	
EM 00-L/ER/IKZ	E11M / SW11	F350098.01	★
EM 01-L/ER/IKZ	E16M / SW17	F350198.01	★
EM 03-L/ER/IKZ	E25M / SW26	F350398.01	★

### Hi-Q/ER, Hi-Q/ERC

Clamping wrenches

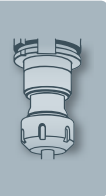
Hi-Q/ER 11, Hi-Q/ERC 20



Hi-Q/ERC 32, Hi-Q/ERC 40



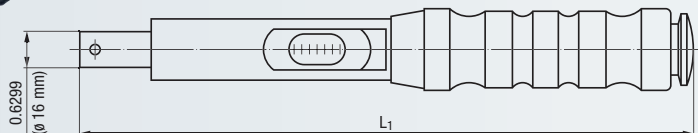
For Clamping Nuts	EDP Number	
Hi-Q/ER 11	QB002002.00170	★
Hi-Q/ERC 20	QB002002.00300	★
Hi-Q/ERC 32	QB002003.0320	★
Hi-Q/ERC 40	QB002003.0400	★



Torque wrenches



**TORCO-FIX**

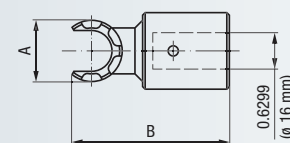


Type	Torque	inch L <sub>1</sub>	EDP Number	
<b>TORCO-FIX 0</b>	1.5 - 18 ft lbs (2 - 25 Nm)	11.417	<b>F0908002</b>	★
<b>TORCO-FIX I</b>	4 - 37 ft lbs (5 - 50 Nm)	13.189	<b>F0908005</b>	★
<b>TORCO-FIX II</b>	15 - 147 ft lbs (20 - 200 Nm)	18.307	<b>F0908020</b>	★
<b>TORCO-FIX III</b>	44 - 221 ft lbs (60 - 300 Nm)	22.244	<b>F0908060</b>	★

Type	For Clamping Nuts	TORCO-FIX	inch		EDP Number	
			A	B		
<b>A-E 8 M</b>	Hi-Q/ERM 8	0	0.488	2.087	<b>F0908500.AE8M</b>	★
<b>A-E 11 M</b>	Hi-Q/ERM 11, Hi-Q/ERM 11	0, I	0.661	2.126	<b>F0908500.AE11M</b>	★
<b>A-E 16 M</b>	Hi-Q/ERM 16	I, II	0.886	2.205	<b>F0908500.AE16M</b>	★
<b>A-E 20 M</b>	Hi-Q/ERM 20	II	1.142	2.677	<b>F0908500.AE20M</b>	★
<b>A-E 25 M</b>	Hi-Q/ERM 25	II	1.417	2.756	<b>F0908500.AE25M</b>	★

Shell-type wrenches

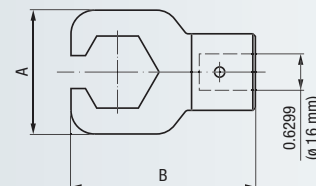
**A-EM**



Type	For Clamping Nuts	TORCO-FIX	inch		EDP Number	
			A	B		
<b>A-E 11 P</b>	Hi-Q/ERC 11, Hi-Q/ER 11	0, I	1.260	2.402	<b>F0908500.AE11P</b>	★
<b>A-E 16 P</b>	Hi-Q/ERC 16	I, II	1.732	2.795	<b>F0908500.AE16P</b>	★
<b>A-E 20 P</b>	Hi-Q/ERC 20	II	2.047	3.189	<b>F0908500.AE20P</b>	★

Shell-type wrenches

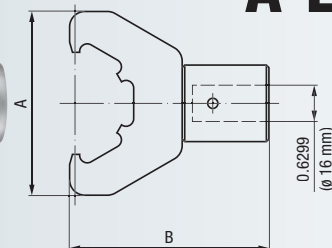
**A-EP**



Type	For Clamping Nuts	TORCO-FIX	inch		EDP Number	
			A	B		
<b>A-E 25</b>	Hi-Q/ERC 25	II, III	2.756	2.835	<b>F0908500.AE25</b>	★
<b>A-E 32</b>	Hi-Q/ERC 32	II, III	3.150	2.835	<b>F0908500.AE32</b>	★
<b>A-E 40</b>	Hi-Q/ERC 40	III	3.780	3.228	<b>F0908500.AE40</b>	★
<b>A-E 50</b>	Hi-Q/ERBC 50	III	4.370	3.701	<b>F0908500.AE50</b>	★

Shell-type wrenches

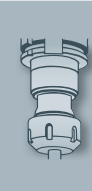
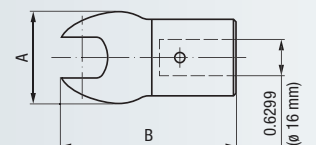
**A-E**



Type	Special Shank Extensions with Hexagonal Clamping Nuts		TORCO-FIX	inch		EDP Number	
	Metric Size	Inch Size		A	B		
<b>A-SW 6</b>	01	-	0	0.650	2.087	<b>F0908500.06</b>	1)
<b>A-SW 8</b>	02	101	0	0.807	2.165	<b>F0908500.08</b>	★
<b>A-SW 9</b>	03, 04	102	0	0.807	2.165	<b>F0908500.09</b>	★
<b>A-SW 12</b>	05, 06	103 - 105	0	1.142	2.244	<b>F0908500.12</b>	★
<b>A-SW 13</b>	07	106, 107	0	1.358	2.323	<b>F0908500.13</b>	★
<b>A-SW 15</b>	08, 09	108, 109	0	1.358	2.323	<b>F0908500.15</b>	★
<b>A-SW 18</b>	10, 11	110, 111	0, I	1.634	2.323	<b>F0908500.18</b>	★
<b>A-SW 22</b>	12, 13	112	I	2.205	2.520	<b>F0908500.22</b>	★
<b>A-SW 26</b>	14	113	II	2.205	2.520	<b>F0908500.26</b>	★
<b>A-SW 28</b>	15	114	II	2.677	2.559	<b>F0908500.28</b>	★
<b>A-SW 30</b>	16	115	II	2.677	2.559	<b>F0908500.30</b>	★
<b>A-SW 36</b>	17	116	II	2.677	2.559	<b>F0908500.36</b>	★

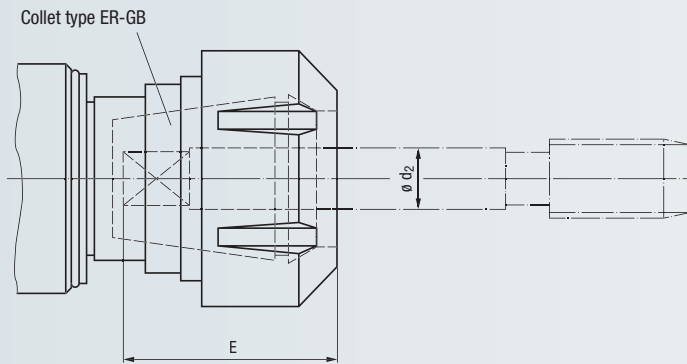
Shell-type wrenches

**A-SW**



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

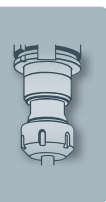
### Metric

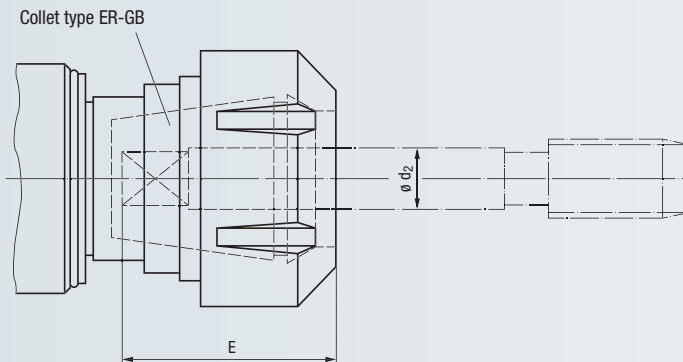


Collets			ER 8		ER 11 GB			ER 16 GB
Clamping Nuts			Hi-Q/ERM 8		Hi-Q/ERM 11	Hi-Q/ER 11	Hi-Q/ERMC 11 Hi-Q/ERC 11	Hi-Q/ERMC 16 Hi-Q/ERC 16
Image 1	Image 2	$\varnothing d_2$ mm	Clamping Depths E mm		Clamping Depths E mm			
			min.	max.				
M0.5 - M0.9		2	9	20				
	M3	2.2	9	20				
M1 - M1.8	M3.5	2.5	14	20				
M2 - M2.6	M4	2.8	15	20	18	17	21	
	M3	3.5	15	19.5	21	20	24	
	M3.5	4	15	19	21	20	24	
	M4	4.5	15	19	21	20	24	26
M4.5 - M6	M8	6			23	22	26	31
	M7	7						31
	M8	8						36
	M9	9						37 / 48 <sup>1)</sup>
	M10	10						43 <sup>1)</sup>

<sup>1)</sup> In combination with collets type ER 16 and Softsynchro® 1 for driven tools

Collets			ER 20 GB		ER 25 GB		ER 32 GB		ER 40 GB		ER 50 GB
Clamping Nuts			Hi-Q/ERMC 20 Hi-Q/ERC 20		Hi-Q/ERMC 25 Hi-Q/ERC 25		Hi-Q/ERC 32		Hi-Q/ERC 40		Hi-Q/ERBC 50 AF
Image 1	Image 2	$\varnothing d_2$ mm	Clamping Depths E mm								
M4	M6	4.5	26	26	26						
M4.5 - M6	M8	6	31	31	31						
	M7	7	31	31	31						
	M8	8	36	36	36						
	M9	9	37	37	37			37			
	M10	10	41	41	41			41			
		11		42	42			42			
		12		42	42			42			
		14		44	44			44			
		16		45	45			45			
	M22 - M24	18						47			
	M27	20						52			
	M30	22						54		70	
	M33	25								72	
	M36	28								74	
	M39 - M42	32								76	
	M45 - M48	36								111 <sup>2)</sup>	



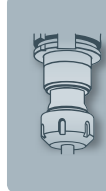


Inch

Collets			ER 8		ER 11 GB		
Clamping Nuts			Hi-Q/ERM 8		Hi-Q/ERM 11	Hi-Q/ER 11	Hi-Q/ERMC 11 Hi-Q/ERC 11
No.	Image	ø d2 inch	Clamping Depths E inch		Clamping Depths E inch		
			min.	max.			
No.0-No.6		0.141	0.59	0.75	0.78	0.74	0.90
No.8		0.168	0.59	0.75			

Collets			ER 20 GB	ER 32 GB	ER 40 GB	ER 50 GB
Clamping Nuts			Hi-Q/ERMC 20 Hi-Q/ERC 20	Hi-Q/ERC 32	Hi-Q/ERC 40	Hi-Q/ERBC 50 AF
No.	Image	ø d2 inch	Clamping Depths E inch			
No.8		0.168	1.16			
No.10		0.194	1.16			
No.12		0.220	1.19			
1/4		0.255	1.22			
1/16 NPT		0.3125	1.45			
5/16		0.318	1.45			
	7/16	0.323	1.48			
	1/2	0.367	1.51			
3/8		0.381	1.51			
1/4		0.255		1.22	1.22	
1/16 NPT		0.3125		1.45	1.45	
5/16		0.318		1.45	1.45	
	7/16	0.323		1.48	1.48	
	1/2	0.367		1.51	1.51	
3/8		0.381		1.51	1.51	
	9/16	0.429		1.68	1.68	
1/8 NPT		0.4375		1.56	1.56	
	5/8	0.480		1.74	1.74	
	11/16	0.542		1.81	1.81	
1/4 NPT		0.5625		1.62	1.62	
	3/4	0.590		1.87	1.87	
	7/8	0.697			1.93	
	1	0.800			2.11	2.73
	1 1/8	0.896				2.80
	1 1/4	1.021				2.92
	1 3/8	1.108				2.98
	1 1/2	1.233				3.05

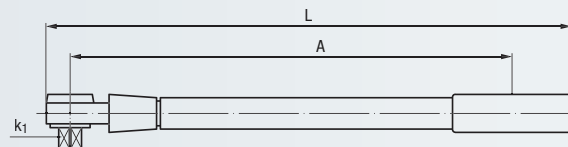
- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
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- SPEED-SYNCHRO
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- Tech. Info

### DEU

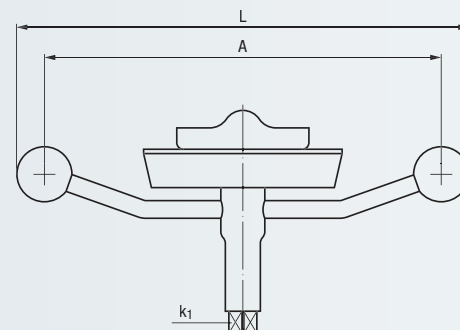
### Single-armed torque wrench



Type	For Adapter Size	Torque		Measuring Range	inch			EDP Number	
		ft lbs	Nm		A	L	k <sub>1</sub>		
DEU-00/1	00	0 - 4.43	0 - 6	M2 - M6 (No.2 - No.12)	8.6614	10.2362	1/4	F0900001	★
DEU-00/1	00/01 (03)	2.21 - 18.44	3 - 25	M6 - M12 (No.10 - 7/16)	7.8740	9.6457	3/8	F0900004	★
DEU-10/1	03/04	14.75 - 147.52	20 - 200	M12 - M27 (7/16 - 1)	16.1417	19.6850	1/2	F0901002	★
DEU-20/1	04/05	51.63 - 516.32	70 - 700	M24 - M52 (7/8 - 1 3/4)	45.2756	49.6063	3/4	F0902002	★

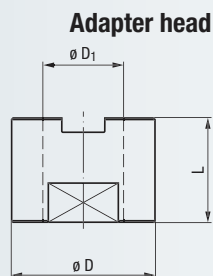
### DEU

### Double-armed torque wrench



Type	For Adapter Size	Torque		Measuring Range	inch			EDP Number	
		ft lbs	Nm		A	L	k <sub>1</sub>		
DEU-00	00/01 (03)	2.21 - 16.96	3 - 23	M6 - M12 (No.10 - 7/16)	7.0866	8.0709	3/8	F0900000	upon request
DEU-10	03/04	14.75 - 132.77	20 - 180	M12 - M27 (7/16 - 1)	24.4094	25.8268	1/2	F0901000	upon request
DEU-20	04/05	51.63 - 516.32	70 - 700	M24 - M52 (7/8 - 1 3/4)	45.2756	51.1811	3/4	F0902000	upon request

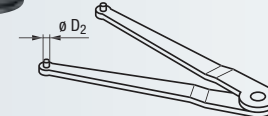
### AEU



Type	For Adapter Size	inch			EDP Number	
		ø D	ø D <sub>1</sub>	L		
AEU-00	00	0.9843	0.5118	0.9843	F0920000	●
AEU-01	01	1.3780	0.7480	1.1024	F0921000	●
AEU-03	03	2.1654	1.2205	1.5748	F0923000	●
AEU-04	04	2.9528	1.8898	2.3622	F0924000	●
AEU-05	05	3.9370	2.3622	2.7559	F0925000	●

### VS

### Spanner with pins



Type	For Adapter Size	inch		EDP Number	
		ø D <sub>2</sub>			
VS-00	00	0.0787		F0930000	●
VS-01	01	0.0984		F0931000	●
VS-03	03	0.1575		F0933000	●
VS-04	04	0.1969		F0934000	●
VS-05	05	0.2362		F0935000	●

The adapter head serves for holding the quick-change adapters and features clamping flats for holding in a vise



**VEU**

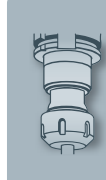
Square pin



Type	For Torque Wrench	inch		mm		EDP Number		inch		EDP Number	
		k <sub>1</sub>		ø d <sub>2</sub>	k <sub>2</sub>			ø d <sub>2</sub>	k <sub>2</sub>		
VEU-00	DEU-00	3/8		2.5	2.1	F0910100	●	0.141	0.110	F0910300	●
				2.8	2.1	F0910101	●	0.168	0.131	F0910301	●
				3.5	2.7	F0910102	●	0.194	0.152	F0910302	●
				4	3	F0910103	●	0.220	0.165	F0910303	●
				4.5	3.4	F0910104	●	0.255	0.191	F0910304	●
				6	4.9	F0910106	●	0.318	0.238	F0910306	●
				7	5.5	F0910107	●	0.323	0.242	F0910307	●
				8	6.2	F0910108	●	0.367	0.275	F0910310	●
				9	7	F0910109	●	0.381	0.286	F0910311	●
				10	8	F0910110	●				
				11	9	F0910111	●				
				12	9	F0910112	●				
				14	11	F0910113	●				
				16	12	F0910114	●				
	18	14.5	F0910115	●							
VEU-10	DEU-10	1/2		4.5	3.4	F0911104	●	0.318	0.238	F0911306	●
				6	4.9	F0911106	●	0.323	0.242	F0911307	●
				7	5.5	F0911107	●	0.367	0.275	F0911310	●
				8	6.2	F0911108	●	0.381	0.286	F0911311	●
				9	7	F0911109	●	0.429	0.322	F0911313	●
				10	8	F0911110	●	0.480	0.360	F0911315	●
				11	9	F0911111	●	0.590	0.442	F0911319	●
				12	9	F0911112	●	0.697	0.523	F0911323	●
				14	11	F0911113	●	0.800	0.600	F0911325	●
				16	12	F0911114	●	0.896	0.672	F0911326	●
				18	14.5	F0911115	●	1.021	0.766	F0911327	●
				20	16	F0911116	●	1.108	0.831	F0911328	●
				22	18	F0911117	●	0.3125	0.234	F0911350	●
				25	20	F0911118	●	0.4375	0.328	F0911351	●
				28	22	F0911119	●	0.5625	0.421	F0911352	●
				32	24	F0911120	●	0.6875	0.515	F0911353	●
	36	29	F0911121	●	0.700	0.531	F0911354	●			
							0.9063	0.679	F0911355	●	
							1.125	0.843	F0911356	●	
VEU-20	DEU-20	3/4		18	14.5	F0912115	●	0.697	0.523	F0912323	●
				20	16	F0912116	●	0.800	0.600	F0912325	●
				22	18	F0912117	●	0.896	0.672	F0912326	●
				25	20	F0912118	●	1.021	0.766	F0912327	●
				28	22	F0912119	●	1.108	0.831	F0912328	●
				32	24	F0912120	●	1.233	0.925	F0912329	●
				36	29	F0912121	●	1.305	0.979	F0912330	●
				40	32	F0912122	●	1.430	1.072	F0912331	●
				45	35	F0912123	●	1.519	1.139	F0912332	●
										1.644	1.233
							0.700	0.531	F0912354	●	
							0.9063	0.679	F0912355	●	
							1.125	0.843	F0912356	●	

These square pins establish the connection between torque wrench and adapter: the square k<sub>1</sub> is inserted into the square seat of the torque wrench, and the shank end d<sub>2</sub> with square k<sub>2</sub> is clamped in the adapter

- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
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## Setting and checking of the overload clutch on quick-change adapters of types EM-U, EM-UL and HF:

Generally speaking, the torque to be set depends on

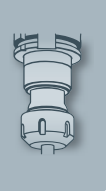
- size
- geometry and coating of the tool
- workpiece material
- type and quality of the coolant-lubricant
- drilled hole diameter

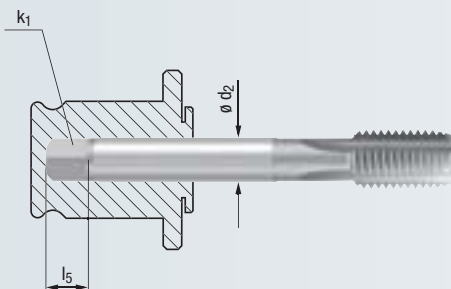
The table contains standard values for thread cutting in steel with a tensile strength of 600-800 N/mm<sup>2</sup>.

These values generally need to be adjusted to the individual work case (e.g. for cold-forming of threads).

Torque		Thread type					
Nm	ft lbs	UNC	UNF	M	G (Whw.) BSP	NPT NPTF	Rc (BSPT)
0.3	0.2	No. 2	No. 2	M2			
0.4	0.3		No. 3	M2.5			
0.5	0.4	No. 3	No. 4				
0.6	0.5			M3			
0.8	0.6	No. 4	No. 5				
1	0.7	No. 5	No. 6	M3.5			
1.2	0.9	No. 6	No. 8				
1.6	1.2	No. 8		M4			
2	1.5		No. 10				
2.5	1.8		No. 12	M5			
3	2.2	No. 10	1/4				
4	3	No. 12					
5	3.7		5/16	M6			
6	4.4	1/4	3/8		G 1/8		
8	6						
10	7.4	5/16	7/16	M8			
12	8.9		1/2				
16	12	3/8				1/16	Rc 1/16
18	13		9/16	M10	G 1/4		
20	15		5/8				
22	16	7/16			G 3/8		
25	18			M12		1/8	Rc 1/8
28	21						
32	24	1/2	3/4				
40	30	9/16					
45	33		7/8	M14			
50	37	5/8		M16	G 1/2		
56	41				G 5/8	1/4	Rc 1/4
63	46						
70	52	3/4	1		G 3/4		
80	59		1 1/8	M18	G 7/8		
90	66		1 1/4	M20		3/8	Rc 3/8
100	74	7/8	1 3/8	M22			
110	81		1 1/2				
125	92						
140	103	1		M24	G 1		
160	118			M27	G 1 1/8	1/2	Rc 1/2
180	133				G 1 1/4		
200	148				G 1 3/8	3/4	Rc 3/4

Torque		Thread type					
Nm	ft lbs	UNC	UNF	M	G (Whw.) BSP	NPT NPTF	Rc (BSPT)
220	162	1 1/8		M30	G 1 1/2		
240	177	1 1/4		M33	G 1 3/4		
260	192				G 2		
280	207			M36			
300	221				G 2 1/4		
320	236			M39			
340	250	1 3/8			G 2 1/2	1	Rc 1
360	266	1 1/2			G 2 3/4		
400	295			M42	G 3		
420	310			M45	G 3 1/4		
450	332				G 3 1/2	1 1/4	Rc 1 1/4
480	354				G 3 3/4		
500	369				G 4		
560	413			M48		1 1/2	Rc 1 1/2
630	465	1 3/4		M52			
710	524			M56		2	Rc 2
800	590			M60			
900	664			M64			
1000	738	2		M68			
1100	811	2 1/4					
1170	863			M72			
1230	907			M76			
1300	959			M80			
1380	1018			M85			
1400	1033	2 1/2				2 1/2	Rc 2 1/2
1460	1077			M90			
1540	1136			M95			
1620	1195			M100			
1700	1254			M105			
1780	1313			M110			
1860	1372			M115			
1940	1431			M120			
2000	1475	2 3/4				3	Rc 3
2020	1490			M125			
2110	1556			M130			
2200	1623						
2270	1674			M140			
2430	1792			M150			
2680	1977			M160			





$\varnothing d_2$ mm	DIN		$\varnothing d_2$ inch	ASME	
	$k_1$ mm	$l_5$ mm		$k_1$ inch	$l_5$ inch
2.5	2.1	5	0.141	0.110	0.19
2.8	2.1	5	0.168	0.131	0.25
3.5	2.7	6	0.194	0.152	0.25
4	3	6	0.220	0.165	0.28
4.5	3.4	6	0.255	0.191	0.31
6	4.9	8	0.3125 <sup>1)</sup>	0.234	0.38
7	5.5	8	0.318	0.238	0.38
8	6.2	9	0.323	0.242	0.41
9	7	10	0.367	0.275	0.44
10	8	11	0.381	0.286	0.44
11	9	12	0.429	0.322	0.50
12	9	12	0.4375 <sup>1)</sup>	0.328	0.38
14	11	14	0.480	0.360	0.56
16	12	15	0.542	0.406	0.63
18	14.5	17	0.5625 <sup>1)</sup>	0.421	0.44
20	16	19	0.590	0.442	0.69
22	18	21	0.652	0.489	0.69
25	20	23	0.6875 <sup>1)</sup>	0.515	0.63
28	22	25	0.697	0.523	0.75
32	24	27	0.700 <sup>1)</sup>	0.531	0.50
36	29	32	0.800	0.600	0.81
40	32	35	0.896	0.672	0.88
45	35	38	0.9063 <sup>1)</sup>	0.679	0.69
			1.021	0.766	1.00
			1.108	0.831	1.06
			1.125 <sup>1)</sup>	0.843	0.81
			1.233	0.925	1.13
			1.305	0.979	1.13
			1.430	1.072	1.25
			1.519	1.139	1.25
			1.644	1.233	1.38

1) NPT/NPTF thread

Product

Finder

Soft-

synchro

KSN

MQL

SFM

SWITCH-

MASTER

GRN-NC

SPEED-

SYNCHRO

HF

EM

Accessories

Tech. Info



- Product Finder
- Soft-synchro
- KSN
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## PGR-GB

With square drive and length adjustment



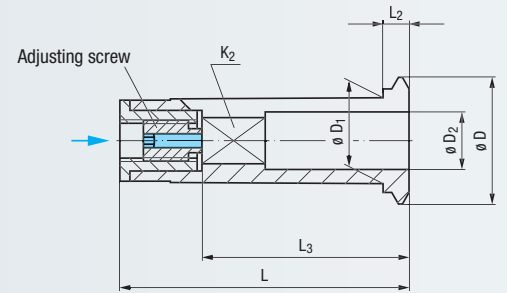
IKZ

MQL

p<sub>max</sub>  
700psi  
(50bar)

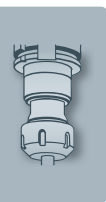
p<sub>max</sub>  
1400psi  
(100bar)

L+



Type	PGR 15 GB	PGR 25 GB	
	M4 - M12	M8 - M20	
Collet	$\phi D$	22	33
Dimensions (mm)	$\phi D_1$	15	25
	L	50.5	60.5
	L <sub>2</sub>	4.5	6

DIN				EDP Number	mm		*	EDP Number	mm		*
$\phi D_2$	K <sub>2</sub>				min	max			L <sub>3</sub>	min	
4.5	3.4	M4	M6	F0942615.4.5	27	29	*				
6	4.9	M4.5 - M6	M8	F0942615.6	29	31	*				
7	5.5	M7	M9 - M10	F0942615.7	29	31	*				
8	6.2	M8	M11	F0942615.8	33.5	36	*	F0942625.8	33.5	36	*
9	7	M9	M12	F0942615.9	34.5	37	*	F0942625.9	34.5	37	*
10	8	M10		F0942615.10	35.5	38	*	F0942625.10	38.5	41	*
11	9		M14					F0942625.11	39.5	42	*
12	9		M16					F0942625.12	39.5	42	*
14	11		M18					F0942625.14	41.5	44	*
16	12		M20					F0942625.16	42.5	45	*



## Technical information

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5.3	Rigid tapping	440 - 443
5.4	Tool monitoring system DDU4	443
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5.9	Adjusting the overload clutch of quick-change tap holders type HF	449 - 450

Product  
FinderSoft-  
synchro

KSN

MQL

SFM

SWITCH-  
MASTER

GRN-NC

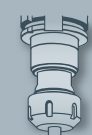
SPEED-  
SYNCHRO

HF

EM

Accessories

Tech. Info



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info**

## 5.1 Description of the symbols for performance characteristics



### Internal coolant supply (IKZ)

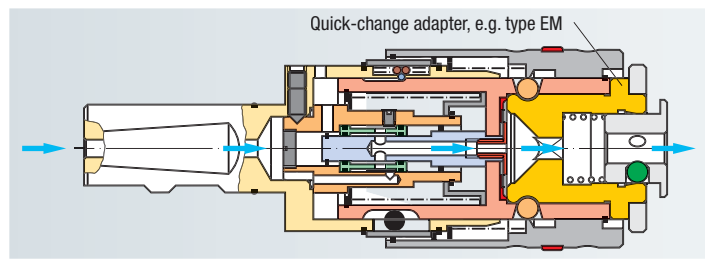
If a machine tool is equipped with internal coolant supply through the machine spindle, then the thread production cycle can be done with special economic efficiency by conducting the coolant-lubricant through the axial bore in the tool, or along the tool shank.

#### The advantages of this arrangement are:

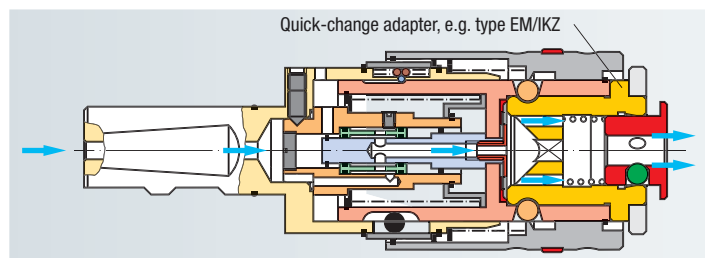
- Perfect lubrication at the cutting edge of the tool
- Improved thread quality
- Chips are washed out of the thread hole

It is, however, necessary to make sure that the coolant-lubricant used is appropriately filtered and that the tap holder used is suitable for the coolant pressure of the machine. Depending on the design of the tool, with or without internal coolant supply, the quick-change adapters are available in two versions:

#### Conduction of internal coolant supply with tools with IKZ:



#### Conduction of internal coolant supply with tools without IKZ:



### Minimum-quantity lubrication (MQL)

Suitable for machines which are equipped with a central minimum-quantity lubrication system – this is often called “dry machining”. In addition to the advantages described under “IKZ” this new lubrication technology is very friendly to the environment. The high cutting data common in wet machining can be used without any change.

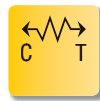
Another advantage is the reduction of costs, since there is no need to purchase and maintain expensive filter installations, or to dispose of used emulsions.

For more detailed information, see **5.5 Minimum-quantity lubrication (MQL)**.

$p_{max}$ 85psi (6bar)	$p_{max}$ 700psi (50bar)	$p_{max}$ 1400psi (100bar)
------------------------------	--------------------------------	----------------------------------

#### Coolant pressure at the entry to the holder

For the sake of trouble-free operation of the tool holders, it is vital not to exceed the specified maximum coolant pressures.



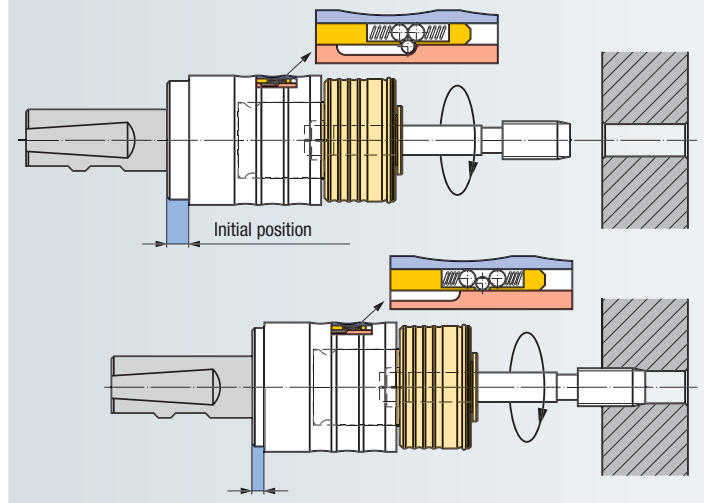
### Length compensation on compression and tension

#### Length compensation on compression

This type of length compensation compensates differences between spindle feed and the pitch of the thread to be produced. If a quick-change adapter with overload clutch is used, the length compensation on compression accommodates spindle feed as soon as the overload clutch responds.

#### Activated length compensation on compression at:

- Plus programming of the control
- Overload on the quick-change adapter with overload clutch

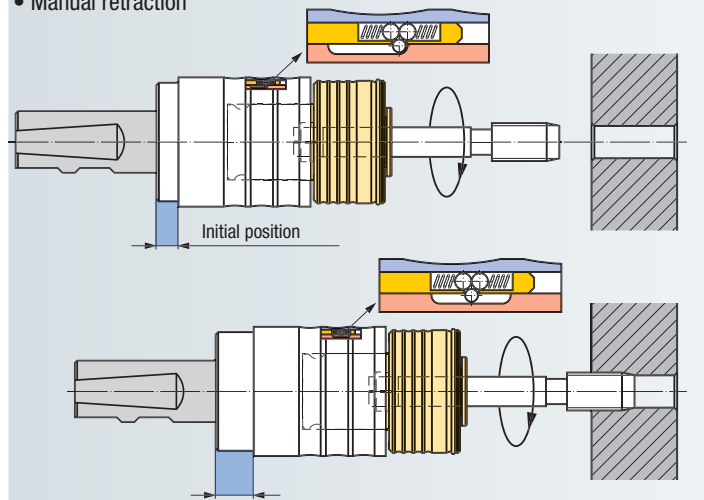


#### Length compensation on tension

This type of length compensation compensates differences between spindle feed and the pitch of the thread to be produced, as well as a spindle overrun at the point of reversal of the thread production cycle. With the tapping attachments, the length compensation on tension assumes the function of switching the sense of rotation from right-hand to left-hand rotation.

#### Activated length compensation on tension at:

- Minus programming of the control
- Manual retraction



## 5.1 Description of the symbols for performance characteristics



### Minimal length compensation

An integrated minimal length compensation on compression and tension compensates minimal pitch differences between synchronous spindle and tool which would lead to excessive friction forces on the thread flanks. A possible increase of axial force during the thread production cycle is reduced to a minimum.

#### The resulting advantages are:

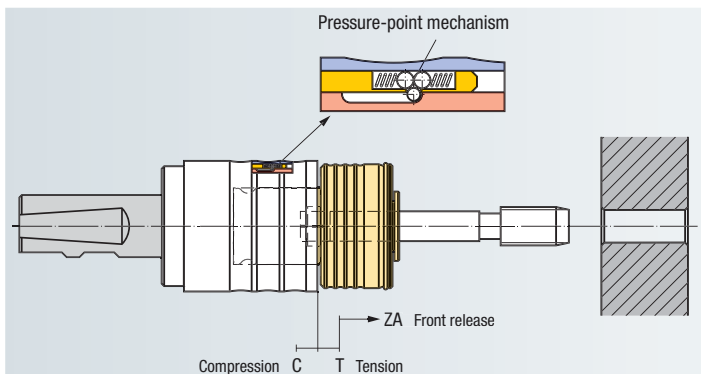
- No miscut threads
- Optimised tool life
- Suitable for internal coolant supply

For more detailed information, see 5.3 Rigid tapping.



### Pressure-point mechanism

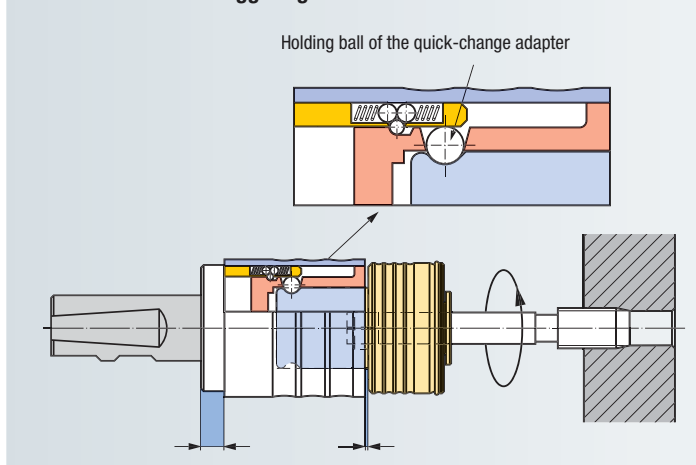
The patented pressure-point mechanism guarantees a safe start of the thread cutting process. The length compensation movement is released by the pressure-point mechanism only when the effective axial force exceeds the normal, permissible start-of-cut force. This helps to achieve reproducible, uniform thread depths.



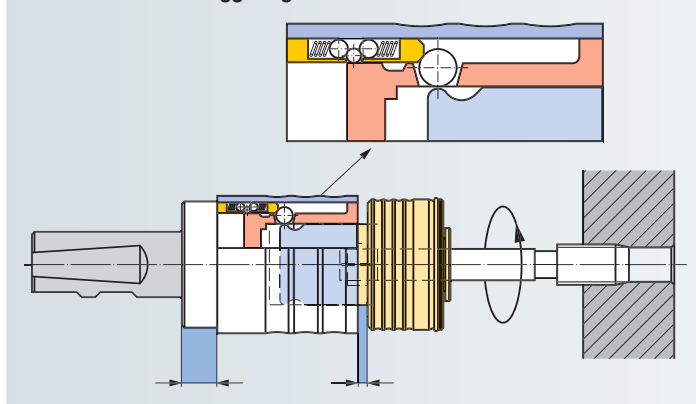
### Front release

The front release protects the quick-change holder, the quick-change adapter and the tool, as well as the workpiece, against damage caused by excessive axial tension. Such tension may occur if the length compensation path is exceeded due to afterrunning of the spindle at the point of reversal, or when the fast-feed function of the tool retraction movement is activated before the tool has come free from the workpiece. In these situations, the quick-change adapter is detached from the holder automatically, avoiding expensive damage.

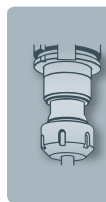
#### Situation before the triggering of the front release



#### Situation after the triggering of the front release



- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

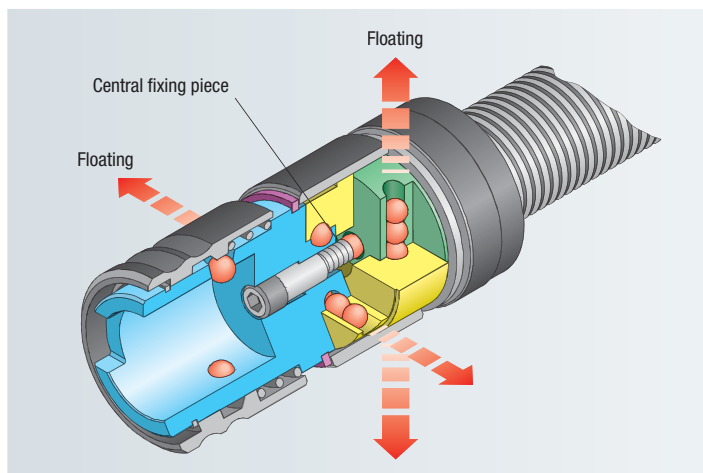
## 5.1 Description of the symbols for performance characteristics



### Axial-parallel floating

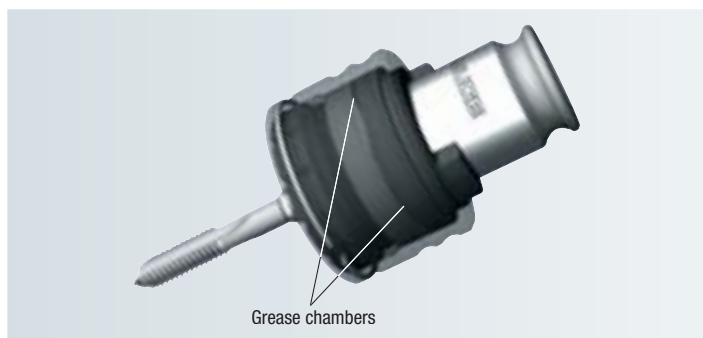
A ball-based floating system guarantees that small errors of alignment between machine spindle and thread hole, or concentricity run-out on the side of the machine spindle, are compensated.

Two parallel drilled holes, offset by 90°, form a precise ball-based linear guide. This arrangement is the perfect solution for the function of the "parallel floating" feature.



### Overload clutch

The wave-line profile overload clutch as developed by EMUGE is characterized by its great wear resistance. Grease chambers between the upper and lower clutch ring provide permanent lubrication during the overload process. When the set torque is exceeded during a threading process, the overload clutch immediately interrupts the torque transfer between machine spindle and tool. This protects the tap against damage.



## 5.1 Description of the symbols for performance characteristics



### Reverse gear

The integrated reverse gear makes a change of the sense of rotation of the machine spindle for reversing superfluous.

**The resulting advantages are:**

- Time savings due to reduced cycle times
- Reduced stress on the machine spindle due to constant right-hand rotation
- Energy savings due to nearly constant power consumption



### Length adjustment

With the length adjustment, the projection length of the quick-change adapter can be re-adjusted or increased in case of need.



### Drilling and countersinking

Drilling and countersinking operations can be done without exchanging the quick-change holder, simply by blocking the length compensation with a locking screw.

**The resulting advantages are:**

- Alignment offset between drilled hole and thread reduced to a minimum
- No time-consuming re-tooling, with according cost reduction



### Tool adaption by means of quick-change adapters, EM series

The quick-change adapters of our EM series have been designed for use in the quick-change tap holders of our KSN and SFM series. The five sizes have been divided into corresponding thread size ranges, and are available in different types. The adaption of the tool is made by means of a quick-change ball clamping system in most quick-change adapters, with a separate adapter being necessary for each shank diameter. Our quick-change adapters are suitable for the production of right-hand and left-hand threads.



### Tool adaption by means of quick-change adapters, HE series

The tool adaption is effected by means of quick-change adapters of our HE series. The clamping of the tool is provided by threaded pins. For our adapters type HE 2/IKZZ, we recommend a fastening torque of 15 Nm.



### Tool adaption by means of collets, type ER (GB)

The tool adaption is effected by means of collets of our ER, or our ER-GB series (with integrated square) acc. DIN ISO 15488 (formerly DIN 6499). This type of clamping helps to achieve very good concentricity and a safe clamping of the tool, especially with high cutting speeds and coolant pressures.



### Tool adaption by means of collets, type PGR-GB

The tool adaption is effected by means of collets of type PGR-GB (with integrated square).

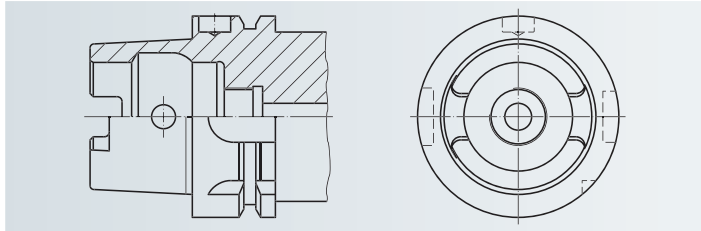


**5.2 Overview of hollow taper shanks with flange contact surface (HSK)**

**DIN 69893-1, ISO 12164-1**

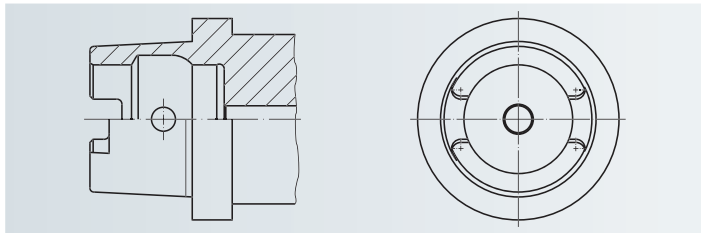
**Form A**

- Standard design for machining centers
- For automatic tool change with gripper and indexing groove
- Central coolant supply by way of coolant tube
- Drive-key slots at the end of the taper
- Bore for data chip (DIN 69873)
- Useable as Form C also, since clamping activation bore is included



**Form C**

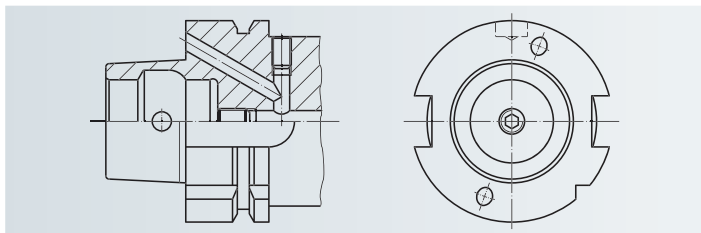
- For special machines and modular tool systems
- For manual tool change
- Central coolant supply
- Drive-key slots at the end of the taper



**DIN 69893-2**

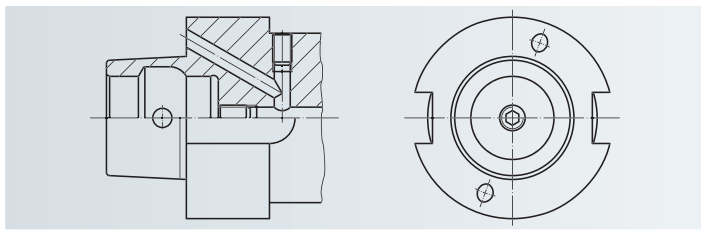
**Form B**

- For machining centers
- With extended flange contact surface for increased radial strength
- For automatic tool change
- Decentralised coolant supply through the flange
- Drive-key slots on the flange
- Bore for data chip (DIN 69873)



**Form D**

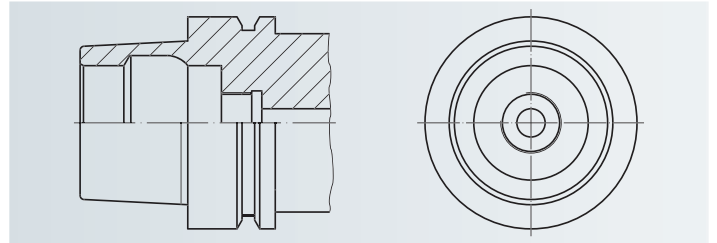
- For special machines
- With extended flange contact surface for increased radial strength
- For manual tool change
- Decentralised coolant supply through the flange
- Drive-key slots on the flange



**DIN 69893-5**

**Form E**

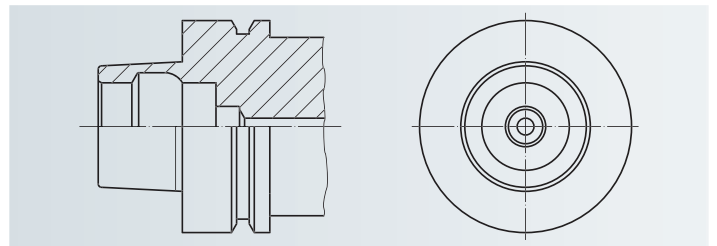
- For high-speed machining
- For automatic tool change
- Central coolant supply by way of a coolant tube is possible
- Without drive-key slots, rotationally symmetric



**DIN 69893-6**

**Form F**

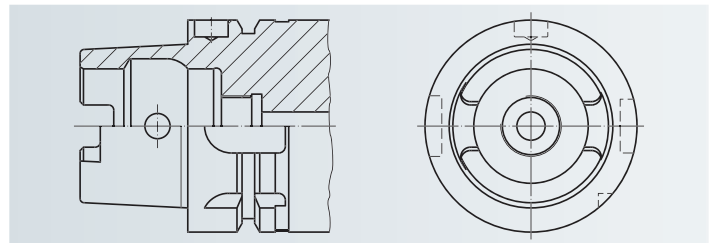
- For high-speed machining, mostly in woodworking
- With extended flange contact surface for increased radial strength
- For automatic tool change
- Central coolant supply by way of a coolant tube is possible
- Without drive-key slots, rotationally symmetric



**ISO 12164-2**

**Form T**

- For turning and milling machines
- For automatic tool change
- Central coolant supply by way of coolant tube
- Modified drive-key slots
- Bore for data chip (DIN 69873)
- Useable as Form C also, since clamping activation bore is included



Product Finder

Soft-synchro

KSN

MLQ

SFM

SWITCH-MASTER

GRN-NC

SPEED-SYNCHRO

HF

EM

Accessories

Tech. Info



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info**

### 5.3 Rigid tapping

#### Why synchronous thread production with rigid collet holders will not result in optimum tool lives.

When producing a thread on a CNC machine with taps or roll form taps (for simplicity's sake, we will call them threading tools in the following) the speed of the rotation movement of the machine spindle with the speed of the feed axis must be registered, accounted and synchronised. When accounting the threading tool pitch and the cutting speed – giving the feed speed, faults may occur caused by parameters not being considered during the control.

Two main influencing variables are:

#### 1. Influencing factors by the CNC machining center

computer speed, resolution of the axis detection (linear axis, turning axis, C-axis), mechanical condition of the machine.

#### 2. Influencing factors by the threading tool

- a) Tolerances of the thread pitch acc. to DIN EN 22857
- b) Change of thread pitch and length of the threading tool when  $t_{\text{Work}} \neq t_{\text{Measurement}}$

#### 1. Influencing factors by the CNC machining center

Regarding the formfitting between tool and workpiece, the cutting and forming of threads with synchronous spindles requires permanent  $\mu$ -exact control and adjusting of the feed axis movement in relation to the rotation movement of the tool spindle. Thus the thread production differs from other known kinds of machining e.g. drilling, reaming or milling. These processings only require an exact linear movement of the control for positioning purposes, as these tools are not connected formfitting with the workpiece. Consequently, the main emphasis of machine manufacturers is on the control of the linear axis. In practice today simply rotary pick-ups with 256 impulses per spindle rotation ( $360^\circ$ ) are used to control the rotation axis. This corresponds to an angle and so a control gap of  $1.4^\circ$  per impulse.

→ Axial forces during thread machining arise caused by control faults or control inaccuracies.

#### Example:

Tap M10

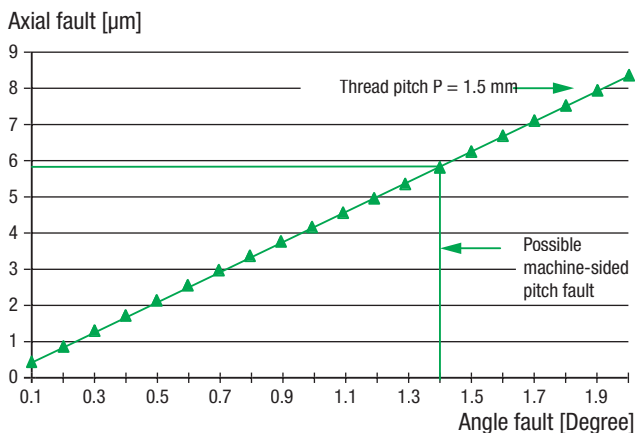
Thread pitch 1.5 mm

Possible uncontrolled spindle rotation  $1.4^\circ$

→ possible axial position fault of about  $5.8 \mu\text{m}$  between threading tool specified position and machine spindle real position.

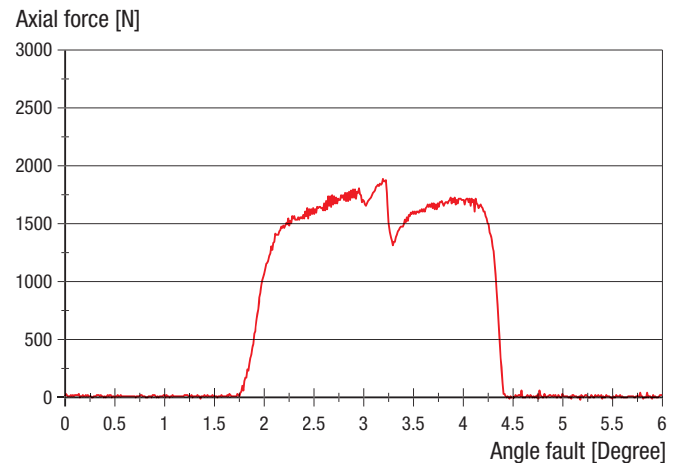
#### Graph machine spindle turning position fault /axial pitch fault (depends on thread pitch)

Effect of machine turning movement fault on the tool

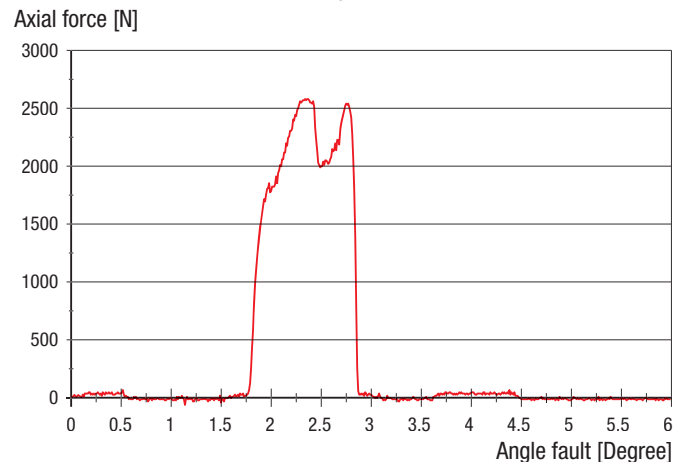


Additionally, the computer speed of modern CNC machining centers is not sufficient to handle a higher number of impulses of the rotary pick-up in the range of  $n = 0$  up to the max. spindle speed and to adjust the axis to be synchronised. The example of a CNC machining center with 256 impulses per spindle rotation shows that the axial force working on the tool flanks, increases with growing cutting speed. The following graphs show that the axial force for forming an M10 thread with 500 rpm (about 51.5 SFM / 15.7 m/min) is at about 427 lbf (1900 N); with an increase of the speed to 2000 rpm (about 206 SFM / 62.8 m/min) at over 562 lbf (2500 N). This clearly shows that the arising axial force, caused by the synchronisation fault, depends on the speed.

Speed 500 rpm  
Roll form tap M10 in C45



Speed 2000 rpm  
Roll form tap M10 in C45



**5.3 Rigid tapping**

**2. Influencing factors by the threading tool**

**a) Tolerances of the thread pitch**

For threading tools the European standard DIN EN 22857 defines the dimensions and tolerances for ground threads.

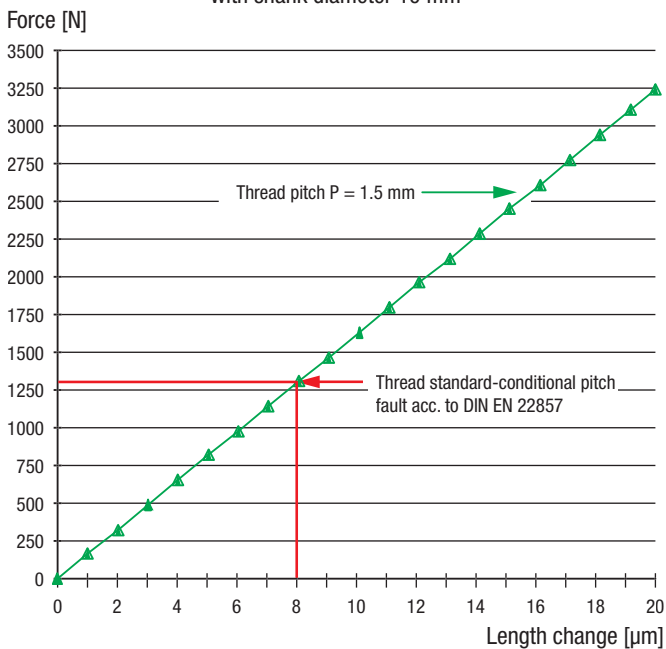
For the tool tolerance the standard allows a smallest deviation of  $\pm 8 \mu\text{m}$  referred to a defined number of threads.

**Example:**

- Tap M10
- Thread pitch 1.5 mm
- Check length 7 threads
- allowed pitch tolerance  $\pm 8 \mu\text{m}$

**Force/Movement graph**

Required force for the length change of threading tool with shank diameter 10 mm



**b) Change of thread pitch and length of the threading tool**

**when  $t_{\text{Work}} \neq t_{\text{Measurement}}$**

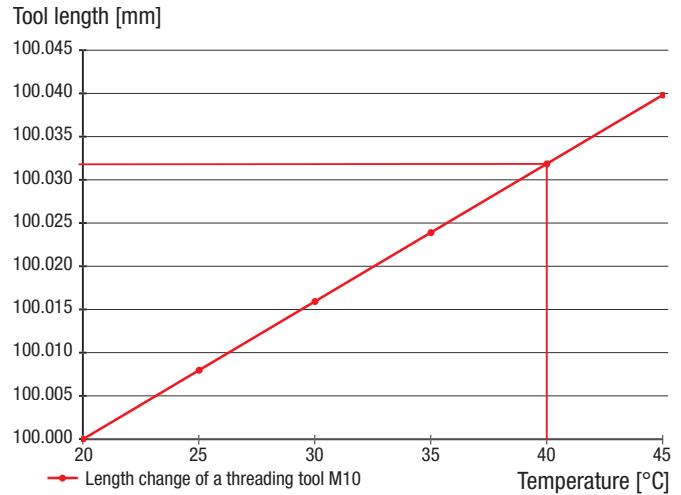
Each tool temperature – differing from the measuring temperature  $20 \text{ }^\circ\text{C}$  – causes a change in length. For an M10 tap with 100 mm length the temperature change from  $20 \text{ }^\circ\text{C}$  to e.g.  $40 \text{ }^\circ\text{C}$  causes length change of  $32 \mu\text{m}$ .

Considering a check length of 7 threads acc. to standard DIN EN 22857 the following **example** results:

- Tap M10
- Thread pitch 1.5 mm
- Tap length 100 mm
- Check length 7 threads = 10.5
- axial growth of the tool and thread pitch of  $3.4 \mu\text{m}$

**Temperature change development of a threading tool M10**

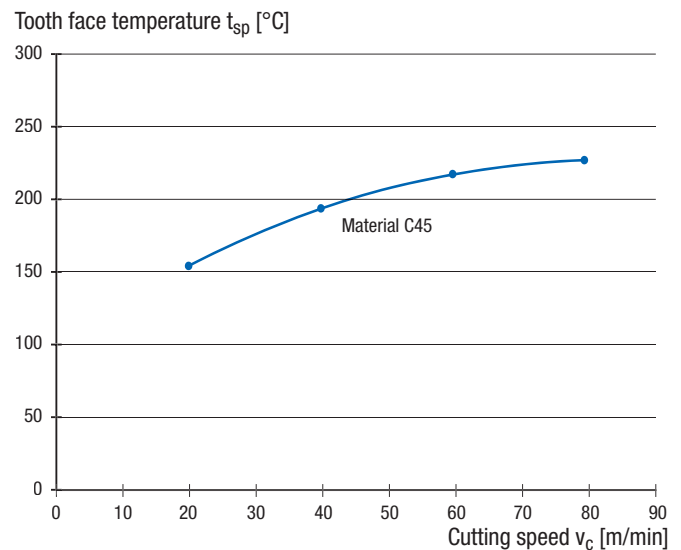
Length 100 mm, temperature change  $20 \text{ }^\circ\text{C}$ , length change  $32 \mu\text{m}$



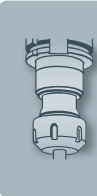
Referred to a check length of 7 threads acc. to DIN EN 22857 and a pitch of 1.5 mm the **axial length would change by  $3.4 \mu\text{m}$** .

The proof of a change in temperature of the threading tool can be given by measuring the cutting face being heaviest used during the thread production. The following graph shows the temperature of the cutting face for a threading tool M10 with various cutting speeds. Material used is C45, coolant-lubricant is 5% emulsion.

**Temperature progressing on the tool tooth face (M10), emulsion as coolant**



- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info**



- Product Finder
- Soft-synchro
- KSN
- MQL
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- Tech. Info

## 5.3 Rigid tapping

### Summary:

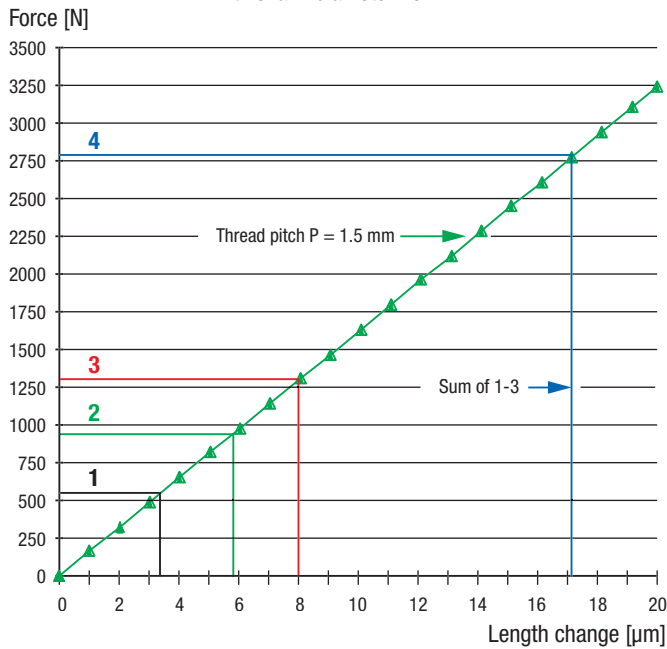
To realize the total effect of the individual influencing factors mentioned before on the axial force component of the thread producing process, the shown possible position faults, length changes resp. the forces causing length changes must be combined.

The following graph shows:

- With an addition of possible axial faults caused by machine pitch tolerance or temperature influencing factors a position fault between specified position of the tap and real position of the machine spindle of more than 17  $\mu\text{m}$  may arise
- **This position fault results in an axial force of about 2800 N** in the shown example with a threading tool M10.
- This force is taken up by the flanks of the tool resulting in increasing flank friction and increased tool wear.

### Force/Movement graph

Required force for the length change of threading tool with shank diameter 10 mm



- 1 Possible temperature-caused pitch fault
- 2 Possible machine-caused pitch fault
- 3 Possible standard resp. threading tool caused pitch fault
- 4 Possible axial force on the tool flanks

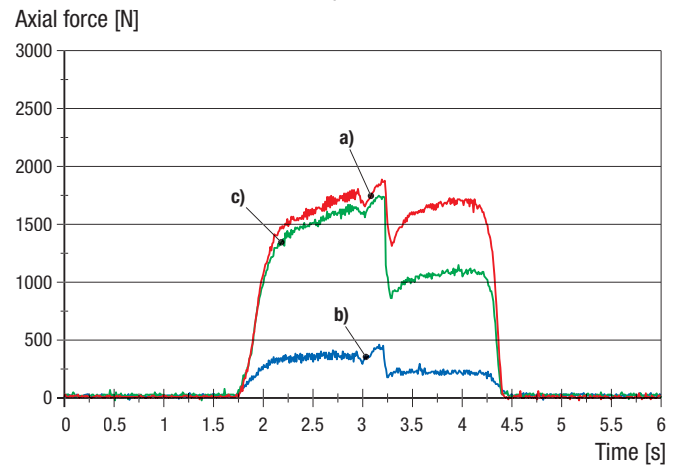
These perhaps theoretical reflections of the processes during production of a thread can be proven in practice.

As an **example** an M10 thread with three different tool holders is formed in material C45. The axial forces were recorded at two speeds which were 500 rpm = 51.5 SFM (15.7 m/min) and 2000 rpm = 206 SFM (62.8 m/min). The following collet adaptions have been tested:

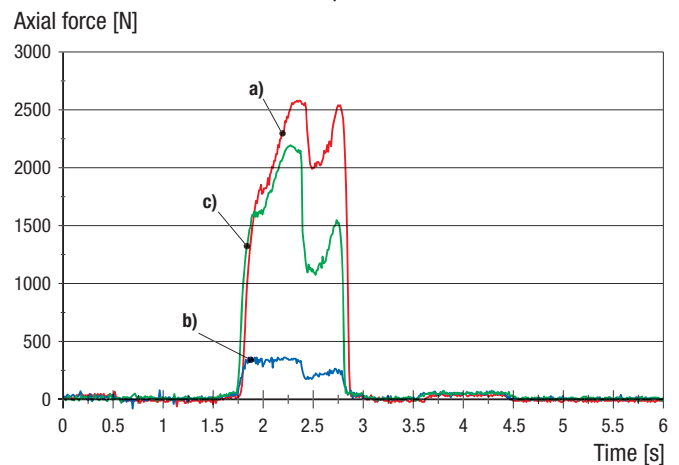
- a) Rigid synchronous collet adaption
- b) EMUGE collet adaption Softsynchro® size 1 with minimum length compensation on compression and tension
- c) Synchronous collet adaption of a competitor with minimum length compensation with axial damping

With all tested collet adaptions a collet type ER20-GB with integrated square was used.

**Speed 500 rpm**  
Roll form tap M10 in C45

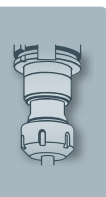


**Speed 2000 rpm**  
Roll form tap M10 in C45



The following results were verified in these tests:

- Axial forces increase with the raise of speed
- The forces which come into play in the cold forming of threads are considerably higher with a rigid collet holder than with an EMUGE collet holder type Softsynchro®
- The competition collet holder can absorb the upcoming forces only lightly, in comparison with the rigid collet holder



### 5.3 Rigid tapping

What is the reason for the outstanding axial force performance of the EMUGE Softsynchro® tap holders with minimum length compensation?

Important feature is the patented designed separation of torque and axial force transmission.

Further design features of the EMUGE Softsynchro® tap holders are:

- Clearance-free C-axes by formfitting torque transmission over steel balls.
- Smooth response of the pre-stressed minimum length compensation after exceeding the constructive defined guiding force by nearly loss-free roll friction of the torque transmission balls in their ball tracks.
- Minimum length compensation and axial force transmission over pre-stressed elastomer springs.
- Elastomer springs preventing the tool cutting edge from bracing by their damping characteristics.

If the separation of torque and axial force transmission is disregarded, an axial fault is caused immediately when starting the thread cutting process, see example of the competition collet holder. Consequently, the axial force immediately increases heavily, see graphs on the preceding page. This is avoided by the practical-related design of the Softsynchro®.

For machine tools not providing the feature of synchronous thread machining it is necessary to use a larger length compensation than the minimum length compensation of the Softsynchro® holders.

EMUGE supplies length compensation holders KSN/HD with collet adaption and internal coolant supply. The advantages of clamping the tool over collets are combined with those of a classic length compensation holder.

### 5.4 Tool monitoring system DDU4

The new tool monitoring system DDU4 is a newly developed system, consequently following upon the already successful ICS and TTS systems. In addition to the current torque indication, you can now also monitor the axial force, contact-free, in real-time. With the option to set fixed response and breakage limits in N or Nm in combination with the ARTIS process monitoring systems, the following recognition features become possible in addition to the standard functions:

- Tool wear
- Missing tool
- Defective thread holes
- Different thread depths
- Material contact
- Tool breakage

Digital signal processing made it possible also to enlarge the measuring range for torque and axial force. These measuring ranges are each subdivided into three steps, each of which can be called off externally.

The DDU4 system is available in two versions:

#### 1. Basic solution: DDU4 as “stand-alone system”

This is an economically efficient upgrading system for tool monitoring. For both torque and axial force, two fixed limit values in Nm or kN can be set. An integrated LCD display will visualize the curve progress, and serve for entering the requested values. Alarm signals are emitted by one switch each for torque and axial force.

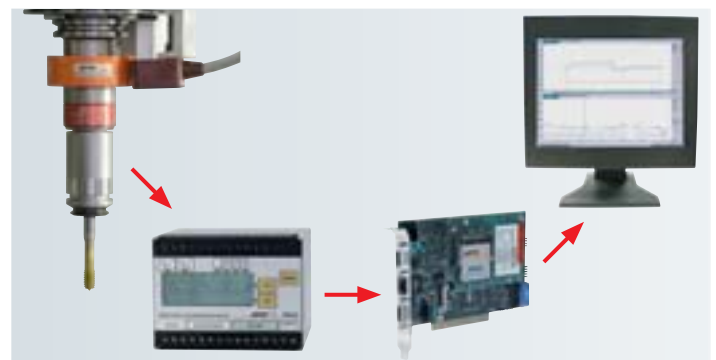
In combination with the process monitoring system CTM, the DDU4 system will serve as a 2-channel measuring converter.



#### 2. DDU4 in combination with CTM

In combination with the CTM process monitoring system, the DDU4 system will offer you as additional performance characteristics the recognition of:

- Tool wear
- Defective thread holes
- Material contact
- Chip clogging
- Missing tool
- Different thread depths
- Tool breakage
- Evaluation for statistical purposes

Product  
FinderSoft-  
synchro

KSN

MQL

SFM

SWITCH-  
MASTER

GRN-NC

SPEED-  
SYNCHRO

HF

EM

Accessories

Tech. Info



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## 5.5 Minimum-quantity lubrication (MQL)

### General information:

By minimum-quantity lubrication, we mean the cooling of machining processes with very small amounts of coolant-lubricant. In this, it is important that the coolant-lubricant is conveyed directly to the point of contact between tool and workpiece in order to reduce the generation of heat by friction there. Even with repeated tool changes, the coolant-lubricant must be dosed and transported to the tool with the highest possible degree of process safety. The term minimum-quantity lubrication applies when a quantity of 5 to 50 ml/h of the MQL medium is consumed, air is used as a carrier medium. This technique is a redeveloped version of wet machining where the machining area is flooded with coolant-lubricant. Another technique is dry machining which is done completely without coolant-lubricant.

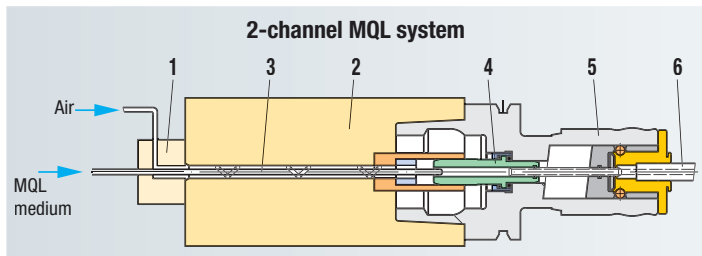
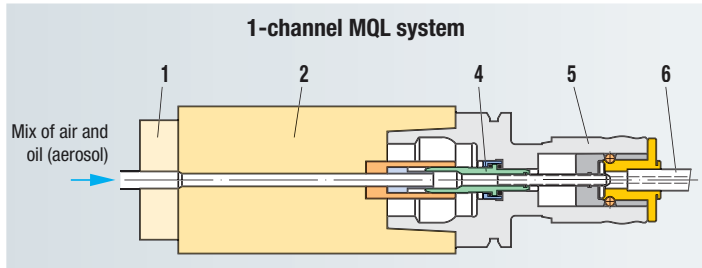
### Different MQL systems:

Generally, we make a distinction between **external** and **internal** MQL systems:

- With **external** supply systems, the aerosol containing the oil is sprayed onto the point of machining through a jet installed in the machining space of the machine tool. No special holders or tools are needed.
- With **internal** supply systems, the MQL medium is conveyed through a rotary transmission, the work spindle, the tool holder and the tool itself, directly to the cutting edge of the tool. For such systems, special holders with a straight feed-through of the MQL medium for perfect flow are necessary. What is also needed are tools specially designed for MQL, with a transfer chamfer adjusted to the holder and with optimised coolant-lubricant outlets.

With the **internal** supply systems, we make a further distinction between **1-channel MQL** systems and **2-channel MQL** systems:

- In a **1-channel MQL** system, the aerosol is generated in the MQL device before it enters into the machine spindle, and is then conducted through the work spindle and the clamping system to the point where it is needed.
- In a **2-channel MQL** system, oil and air are conducted through the spindle separately, the mixing of the two media is done only at the point where they enter the tool holder.



- |                       |                 |
|-----------------------|-----------------|
| 1 Rotary transmission | 4 Transfer unit |
| 2 Work spindle        | 5 Tool holder   |
| 3 MQL medium lance    | 6 Tool          |

### The tool holders:

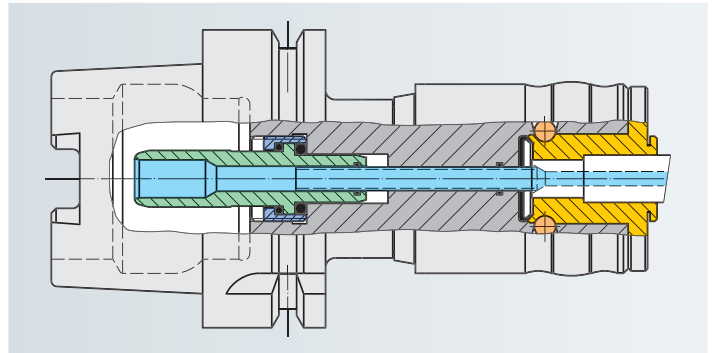
Tool holders for minimum-quantity lubrication must not only provide safe clamping for the tool, but must also permit unhindered, loss-free and free-flow through-feed of the aerosol. In 2-channel MQL systems, it is also necessary to produce the mix of oil and air during the transfer from the spindle to the shank. These challenges have led to the design of special quick-change and collet holders which meet the requirements of the different MQL systems. Additionally, several company standards and the standard DIN 69090 were established for a clear specification of the point of transfer from spindle to tool holder. Our EMUGE holders, needless to say, meet all the requirements of these standards, too.

In order to avoid dead spaces and oil clogs, EMUGE offers also the suitable tools for minimum-quantity lubrication. With their detailed adjustment to the holders, an optimised transfer from tool holder to tool can be guaranteed.

### The following tool holders are available:

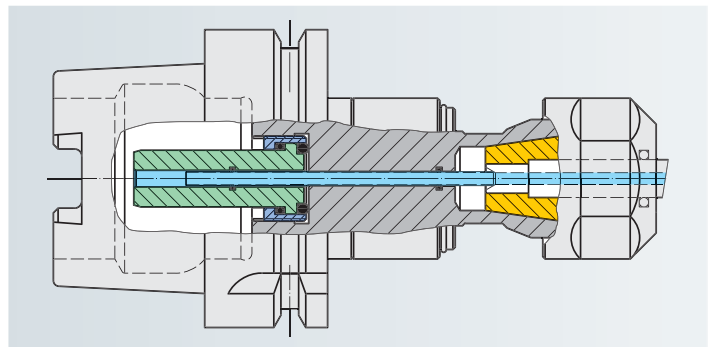
#### 1. KSN/MQL:

These quick-change holders are equipped with length compensation on tension and compression, with the EMUGE patented pressure-point mechanism and the proven front release. In addition, a spring-loaded tube guarantees a disturbance-free feed-through of the aerosol. This same tube also provides the permanent transfer of the aerosol from the tool holder to the tool. As a complement, EMUGE offers adapters type EM/MQL which provide a sealing surface between quick-change holder and quick-change adapter. This sealing surface is especially helpful in the machining of cast materials and in "overhead" machining situations.



#### 2. Softsynchro®/MQL:

These collet holders are equipped with the well-known minimal length compensation with separate transfer of torque and axial force, see also chapter 5.3 Rigid tapping. Again, there is an optimised feed-through for perfect flow ensured by a spring-loaded tube. This tube is always in firm contact with the end of the tool shank due to the spring pressure, and guarantees loss-free transfer.



## 5.6 Tapping attachments SWITCH-MASTER® and GRN-NC

### Application range:

The tapping attachments of our SWITCH-MASTER® and GRN-NC series are designed for use on CNC-controlled machine tools.

### General specifications:

- The integrated reverse gear makes a change of the sense of rotation of the machine spindle for reversal superfluous. The absorption elements integrated in the reverse gear compensate the acceleration forces caused by the change of the sense of rotation of the clamping head. The resulting advantages are as follows:
  - Time savings due to reduced cycle times
  - Reduced stress on the machine spindle due to constant right-hand rotation
  - Maximum tool life of the threading tools
  - Energy savings due to almost constant power consumption
- Design for coolant pressure up to 700 psi (50 bar)
- Safe and high-concentricity clamping of the tool by means of collets (for improved torque transfer we recommend using collets type ER-GB with integrated square)
- The connection to the machine spindle is a straight shank dia. 25 mm according to DIN 1835 B resp. DIN 1835 B+E; the use of adapter shanks is a fast and economically efficient way of guaranteeing the compatibility with all the usual spindle adaptations
- The tapping attachments SWITCH-MASTER® and GRN-NC are designed for the production of right-hand threads only; for the SWITCH-MASTER®, however, there is a possibility of designing the attachment for left-hand threads – the sense of rotation of the machine spindle will always remain right-hand.

### Additional specifications type SWITCH-MASTER®:

- Tapping attachments of type SWITCH-MASTER® are available in two designs (90°, 180°)
- Suitable for speeds up to max. 3000 rpm
- Smooth, low-wear operation thanks to oil-bath lubrication
- Safe sealing against the penetration of coolant-lubricant into the housing, by separating the axial and rotational movement of the clamping head
- Minimized wear on the gear elements due to extremely fast changes of the sense of rotation (35 ms)
- Constant thread depths thanks to an exactly defined switching point
- Reduced safety distance of 0.1969 (5 mm) between workpiece and tool thanks to short gear change paths; this yields an additional reduction of cycle times
- Almost constant cutting speed, resulting in an increase of tool life
- On the machine side, pressurized air  $85^{+14}_{-7}$  psi ( $6^{+1}_{-0.5}$  bar) is needed as auxiliary energy for the change of the sense of rotation

### Additional specifications type GRN-NC:

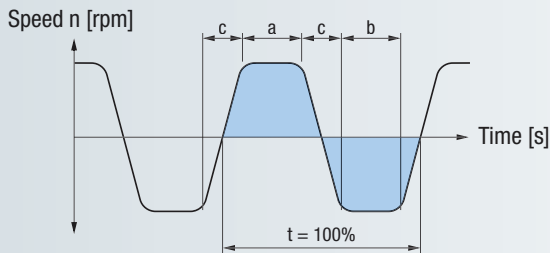
- Tapping attachments of type GRN-NC series are available in different sizes
- Suitable for speeds up to max. 2500 rpm
- Transmission ratio advance/reversal 1:0.946

### Service

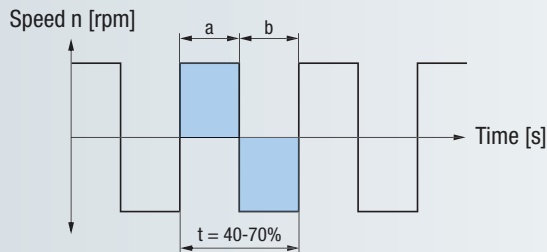
In case spare parts need to be exchanged, EMUGE offers you a repair service that includes e.g. competent repair and maintenance, a professional pressure check and function control with full guarantee.

### Time spent on thread production with different tool holders

#### Conventional tool holder

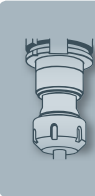


#### Tapping attachment SWITCH-MASTER® or GRN-NC



- a = Time for thread production
- b = Time for reversal of the threading tool
- c = Time for switching from right-hand to left-hand rotation of the threading tool
- t = Time spent on thread production

- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info**



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## 5.6 Tapping attachments SWITCH-MASTER® and GRN-NC

For the use of our tapping attachments, a stop fixture is needed for the following functions:

- Supporting the torque caused by the operation of the attachment
- Correct definition of the position between machine spindle and stop fixture whenever automatic tool exchange devices are used
- Supply of the auxiliary energy necessary for the change of the sense of rotation on the SWITCH-MASTER® = pressurized air  $85^{+14}_{-7}$  psi ( $6^{+1}_{-0.5}$  bar)

The stop fixture is normally fitted individually to the customer's machine before shipping of the attachment.

### Specifications for the stop fixture

Address

.....

.....

.....

Machine type / description

.....

Machine no.

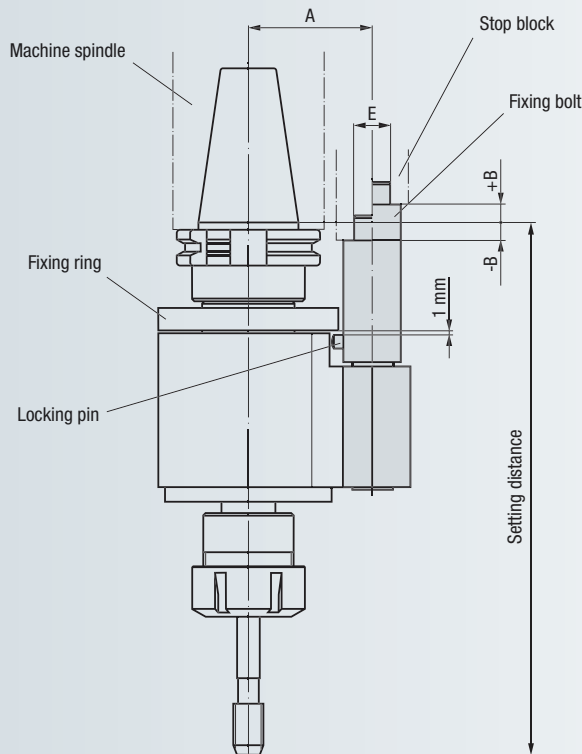
.....

Dimensions

A: ..... B: ..... E: .....

Shank type and size

.....



### Thread production cycle (example)

The tapping attachment is changed into the machine by means of the tool exchanging device, the stop fixture bolt engages in the stop block, the locking device is released and the attachment is ready for operation.

The attachment is moved to start position in the fast-feed mode. The safety distance x must be observed.

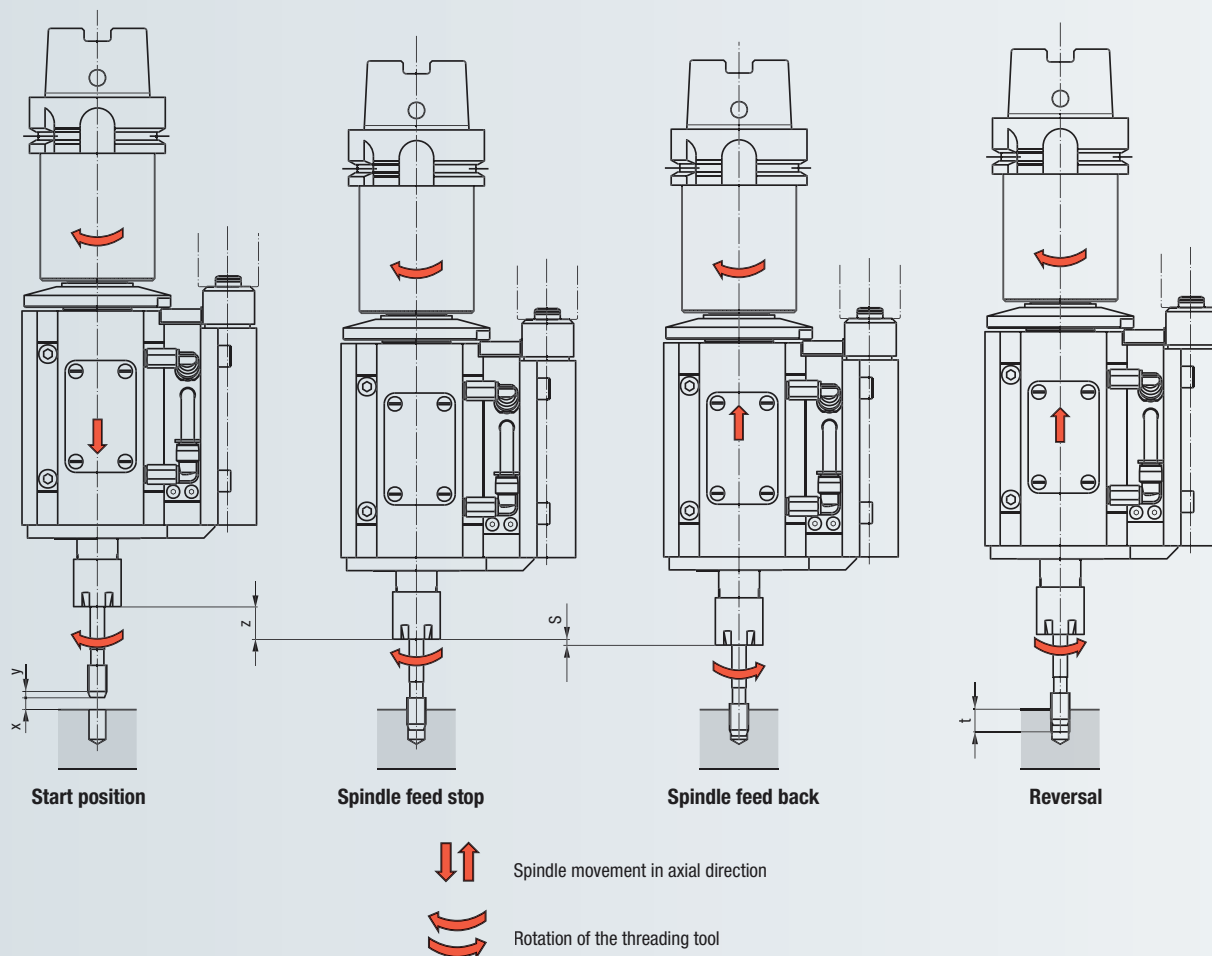
The work cycle is performed. During the whole cycle, the machine spindle rotates in a right-hand direction. After reaching the programmed feed depth, the Z-axis switches to reverse without any delay. In the interaction between feed reversal of the Z-axis and the positive feed caused by the pitch of the rotating tool the clamping head of the tool holder is pulled axially from the tapping attachment. This movement operates the change of the sense of rotation (reversal). When the tool has come entirely free from the workpiece the spring-loaded clamping head retracts to its original position, and the sense of rotation of the tool is changed again.

The machine spindle is again in start position.



5.7 Thread production cycle of tapping attachment type SWITCH-MASTER®

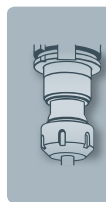
- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info**



**Example for the travel z to be programmed:**

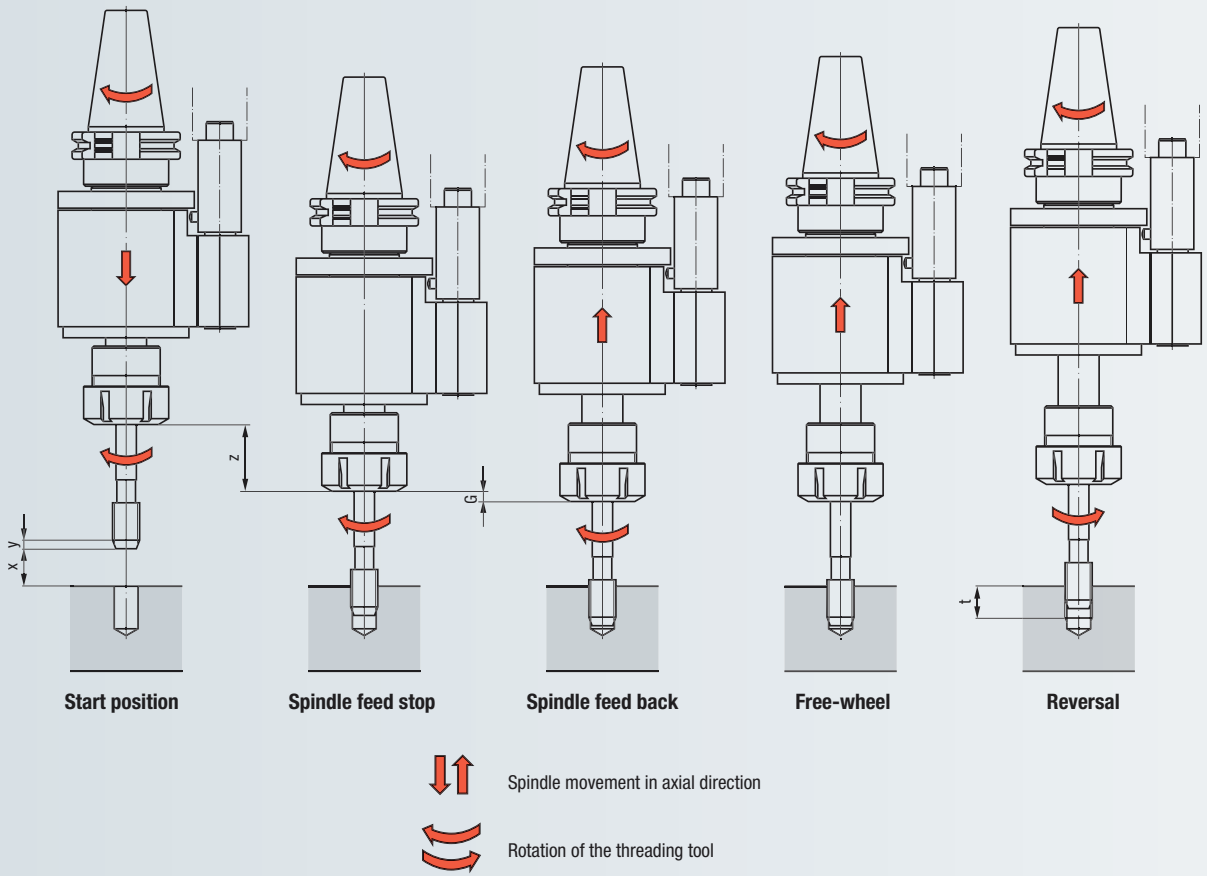
$$z = y + x + t - S$$

- z = Travel
- y = Chamfer length of tap or lead taper length of roll form tap
- x = Safety distance 0.1969 (5 mm)
- t = Thread depth to be produced
- S = Gear change path = 0.1181 (3 mm)



- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## 5.8 Thread production cycle of tapping attachment type GRN-NC

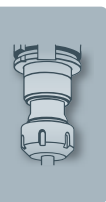


$$z = y + x + t - 0.5 G$$

- Example for the travel z to be programmed:**
- z = Travel
  - y = Chamfer length of tap or lead taper length of roll form tap
  - x = Safety distance
  - t = Thread depth to be produced
  - G = Disengaging distance

Recommended safety distance: min. 0.5512 (14 mm)

The travel depends on factors like speed and the material to be machined, and must be corrected accordingly in case of need.



- Product Finder
- Soft-synchro
- KSN
- MLQ
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info**

## 5.9 Adjusting the overload clutch of quick-change tap holders type HF

### Adjusting the torque of the overload clutch

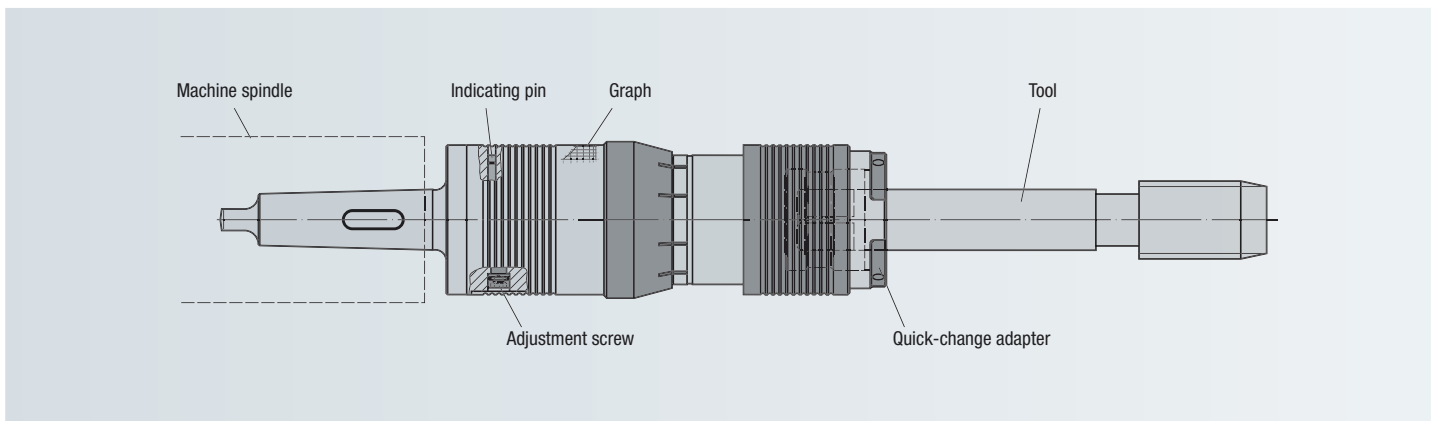
The torque to be set depends, among other things, on the type of machining and on the workpiece material to be machined. If the exact torque is not known, we recommend setting a low value first, and approaching the correct torque value step by step.

**Attention:** The adjustment must not be carried out while the machine spindle rotates!

**Required tools:**

- Hexagon socket wrench with pin, width across flats 10 mm
- Depth measurement device or caliper gauge with depth measurement

1. Clamp the quick-change tap holder in the machine spindle.

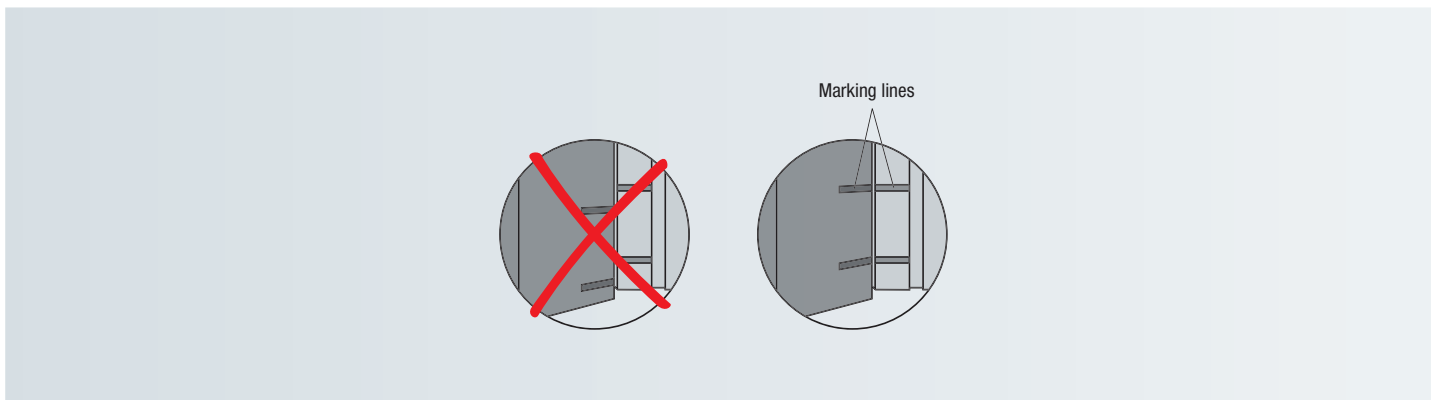


2. For torque adjustment, the marking rings must coincide.

If this is not the case, proceed as follows:

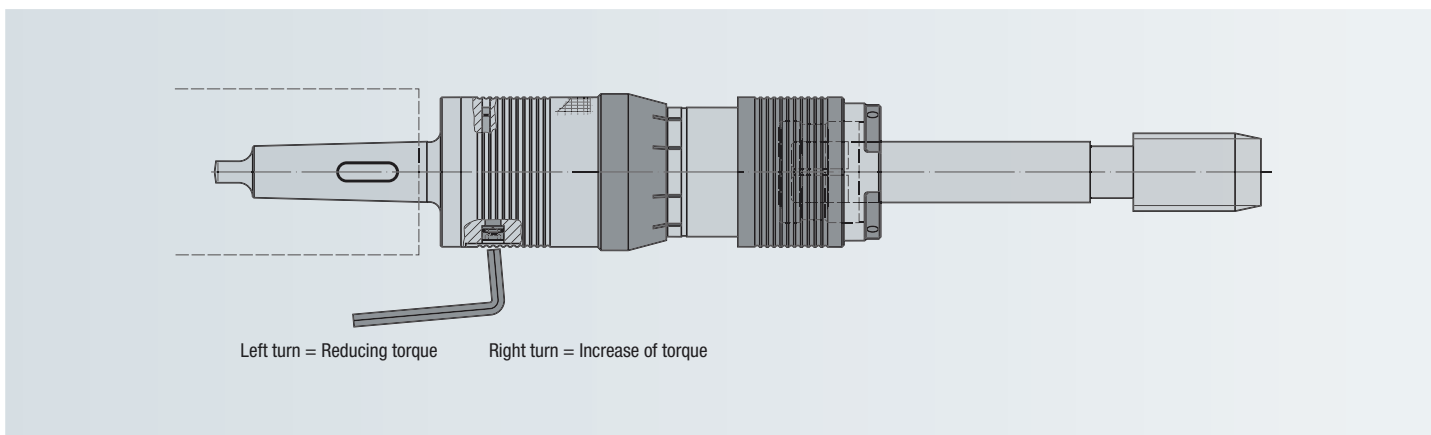
- Put machine into operation
- Let the tool start the cutting process
- Stop machine

**Attention:** Repeat this until the marking lines coincide!



3. Adjust torque by turning adjustment screw.

**Attention:** Do not use any extension for adjusting the torque!

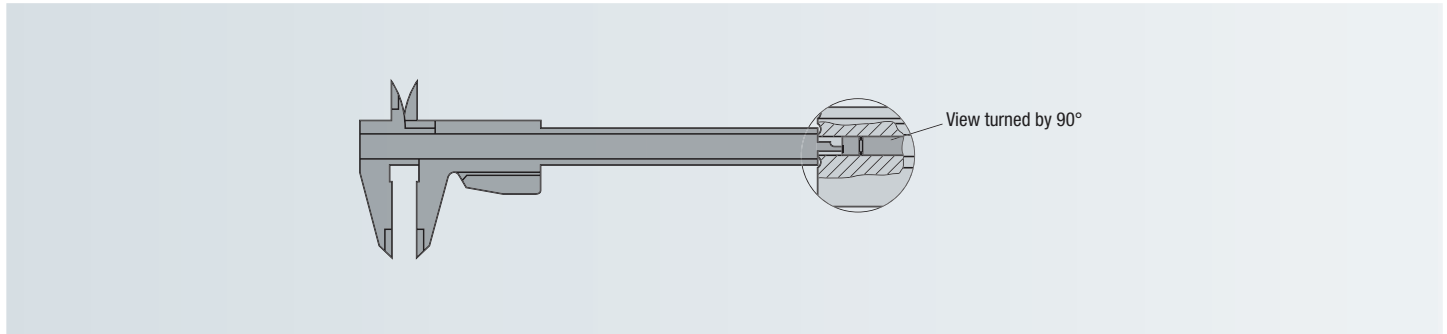


- Product Finder
- Soft-synchro
- KSN
- MQL
- SFM
- SWITCH-MASTER
- GRN-NC
- SPEED-SYNCHRO
- HF
- EM
- Accessories
- Tech. Info

## 5.9 Adjusting the overload clutch of quick-change tap holders HF

4. Check torque by:
- Measuring the position of the indicating pin using the depth measurement device
  - Reading the torque from the graph (the graph is fixed on the quick-change tap holder body)

**Example:** HF 20, measuring depth 2.7 mm Torque read from graph: 625 Nm  
 The max. torque is adjusted if the indicating pin matches with the quick-change tap holder diameter.

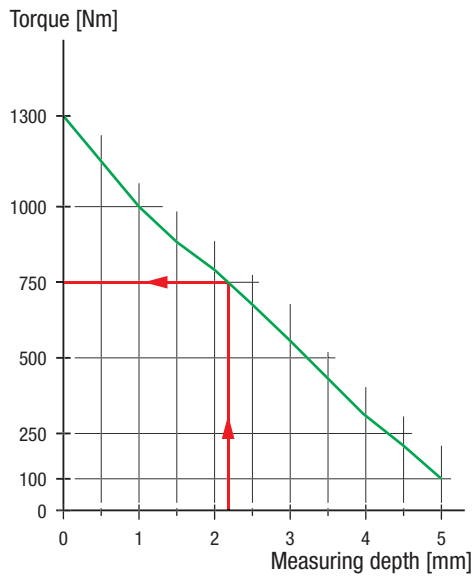


### Torque progression

The following graphs are printed onto the quick-change tap holder near the adjustment unit in similar form.

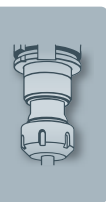
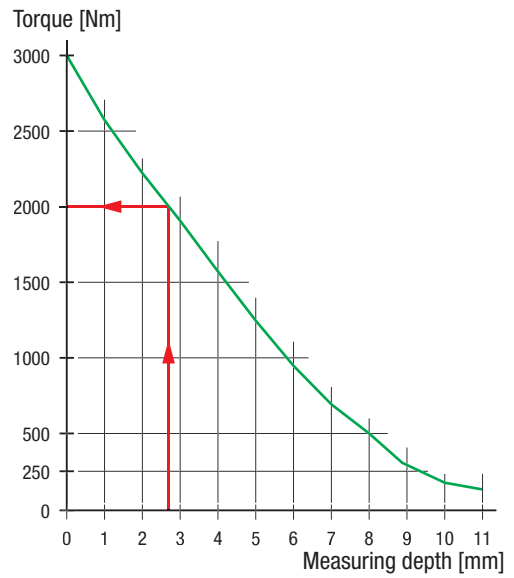
#### Torque progression for the quick-change tap holder HF 20

**Example:** Measuring depth 2.2 mm from graph: 750 Nm adjusted torque

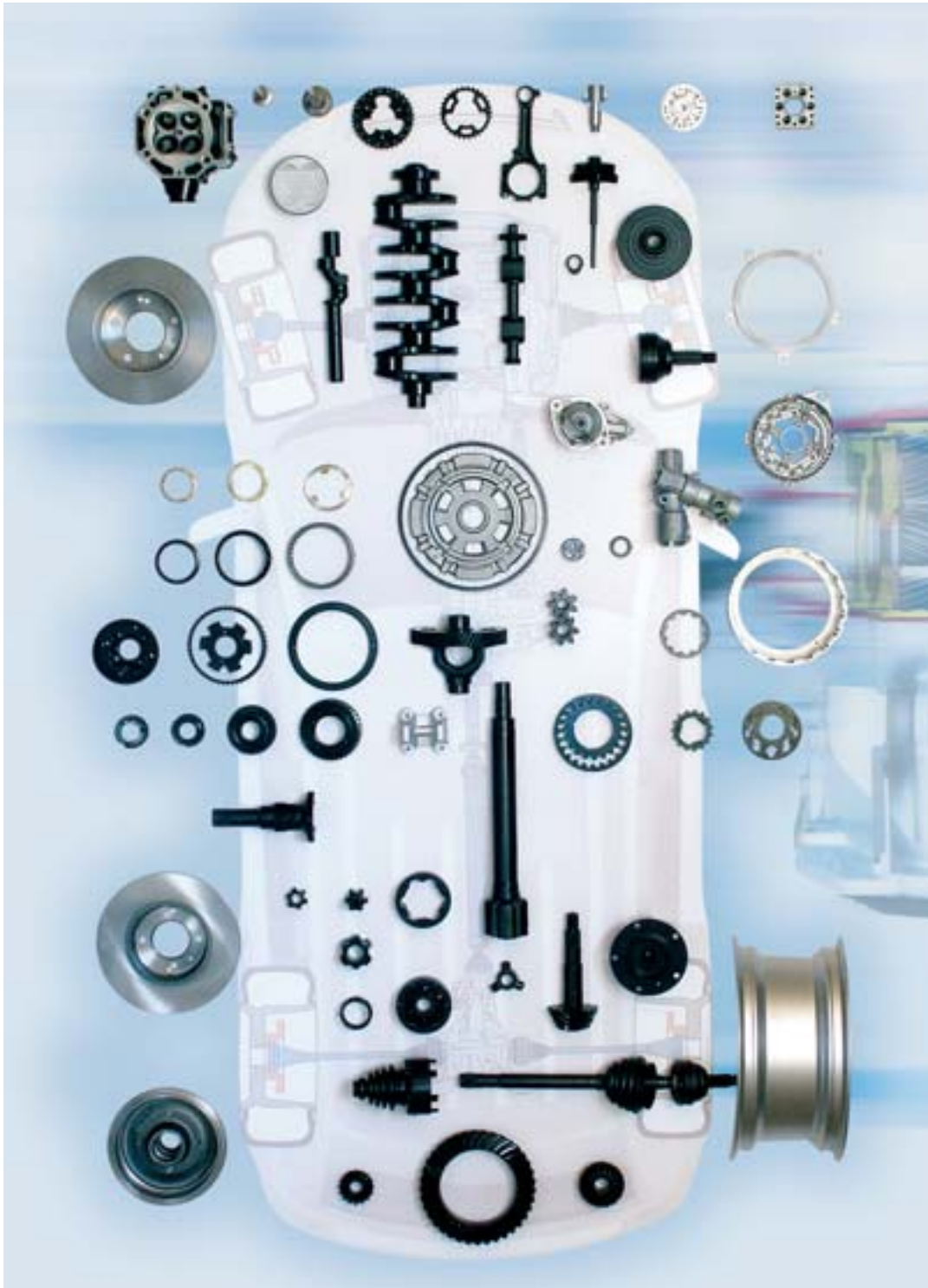


#### Torque progression for the quick-change tap holder HF 30

**Example:** Measuring depth 2.75 mm from graph: 2000 Nm adjusted torque







In addition to our collet holders, quick-change holders and tapping attachments, EMUGE also offers **precision clamping tools for workpiece clamping**. The largest part of these clamping tools are designed especially for individual customers' applications, and are, as a consequence, **highly optimised special solutions for specific production processes**. In order to achieve such solutions, it is strictly necessary to analyse all the basic conditions, e.g. machine equipment, precision requirements, details of the production process etc., even in the first planning stage, with a close view to practical work conditions.



**System Specifications:**

Workpiece clamping is an essential element of the production process. The largest part of these clamping tools are specially designed for the application case described by the user, which means they are special solutions optimised for the individual production process.

In the development of these clamping tools, all basic conditions like machine equipment, precision requirements and process sequence, must be taken into account with as much regard to practical conditions as possible.

EMUGE, as one of the leading manufacturers of such clamping equipment, uses various clamping principles which we will describe in detail below. The values listed below are only **reference values**.

Features	System				
	SP	SZ	SG	SH	SM
System set-up	mechanical	mechanical	mechanical	hydraulic	mechanical
Achievable concentricity	2 µm	4 µm	4 µm	2 µm	4 µm
Max. expansion in reference to clamping diameter	IT7 (11)	IT13	IT13	IT7	0.1 - 0.6 mm
Clamping ranges, workpiece outside diameter	5 - 400 mm	5 - 400 mm	6 - 300 mm	5 - 300 mm	6 - 300 mm
Clamping ranges, workpiece inside diameter	12 - 400 mm	8 - 400 mm	12 - 300 mm	12 - 300 mm	–
Safety function against over-clamping	yes	yes	yes	partially	yes
Wear protection coating possible	yes	yes	yes	yes	yes

$F_R$  = Radial force

$F_A$  = Axial force

$F_E$  = Application of force

$P_E$  = Application of pressure

Degree of tolerance	Nominal size range in mm											
	≤ 3	> 3 ≤ 6	> 6 ≤ 10	> 10 ≤ 18	> 18 ≤ 30	> 30 ≤ 50	> 50 ≤ 80	> 80 ≤ 120	> 120 ≤ 180	> 180 ≤ 250	> 250 ≤ 315	> 315 ≤ 400
<b>IT7</b>	10	12	15	18	21	25	30	35	40	46	52	57
<b>IT11</b>	60	75	90	110	130	160	190	220	250	290	320	360
<b>IT13</b>	140	180	220	270	330	390	460	540	630	720	810	890

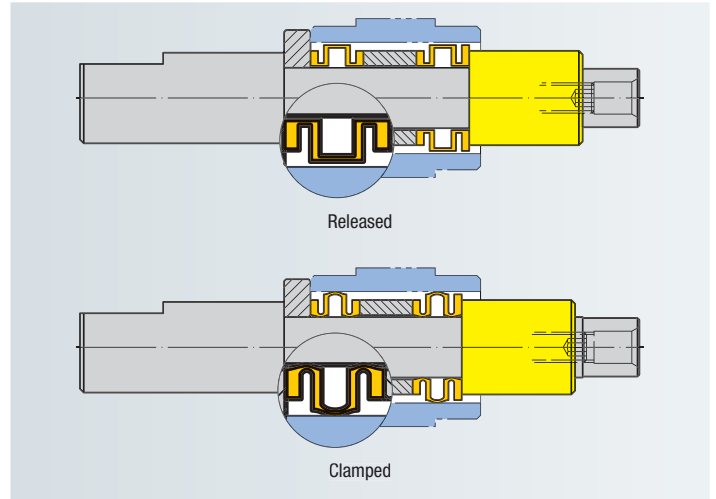


## System SP

By applying an axial force the clamping sleeves move in direction of the force and expand radially. On the one hand this eliminates the clearance between clamping sleeve and body, on the other hand between clamping sleeve and workpiece. The workpiece is being clamped.

Depending on the tolerance of the workpiece, on the design of the clamping tool and of the clamping sleeves the system SP achieves concentricities of  $\leq 0.002$  mm (corresponding to  $\leq 0.0001$  inch).

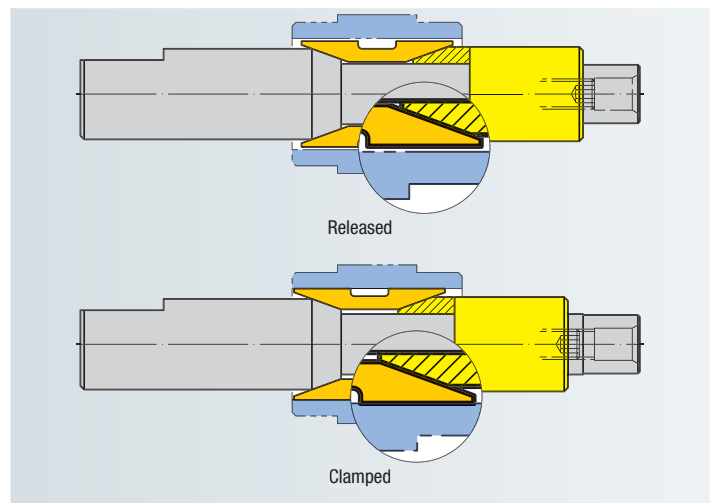
Due to this high precision the system SP is not only used to clamp workpieces, it is also used to clamp tools.



## System SZ

If the workpiece to be clamped has only a short clamping base or if the diameter to be clamped has a very large tolerance, system SZ is used.

By applying an axial force a slitted collet is radially expanded by a cone. Simultaneously an axial movement occurs. The workpiece is being clamped.

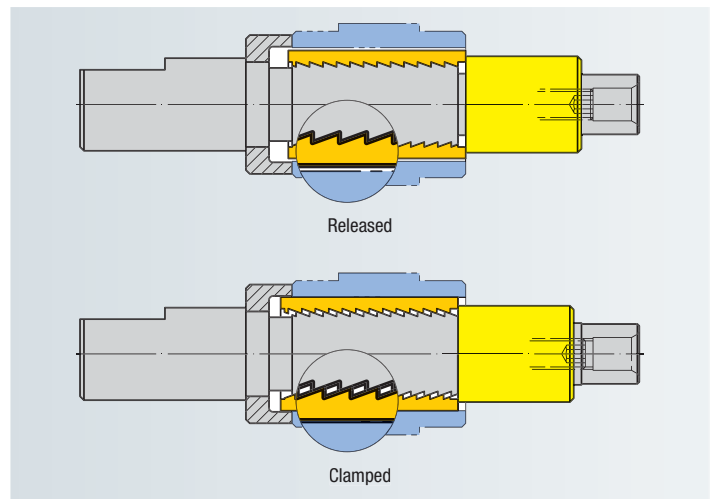


## System SG

Depending on the type of design the system SP only allows radial expansion up to tolerance class IT11. To bridge larger tolerances, system SG is used.

This is a slitted clamping bush with a special buttress thread. With this thread the bush is screwed onto the body. By applying an axial force the clamping bush moves in direction of the force. Due to the thread angle there is also a radial expansion. The workpiece is being clamped.

The axial component, which has an effect on the workpiece, increases the transferable torque and the stiffness of the clamping process. Consequently the workpiece is safely clamped even if it is machined with a large depth of cut.

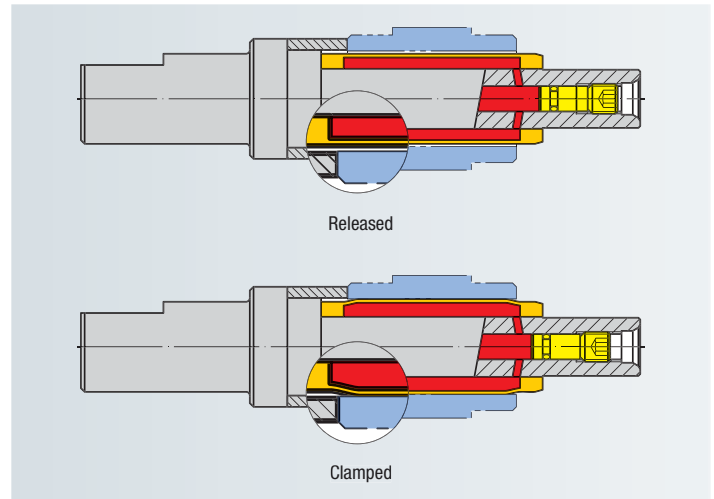




## System SH

If there is not enough room for a mechanical clamping system, hydraulic system SH is used. It also allows clamping long, thin-walled workpieces or a number of similar workpieces.

System SH is a closed system filled with hydraulic oil. A force is applied on it with a piston. The hydraulic pressure radially expands the thin-walled clamping zone. The workpiece/the workpieces is/are being clamped.



## System SM

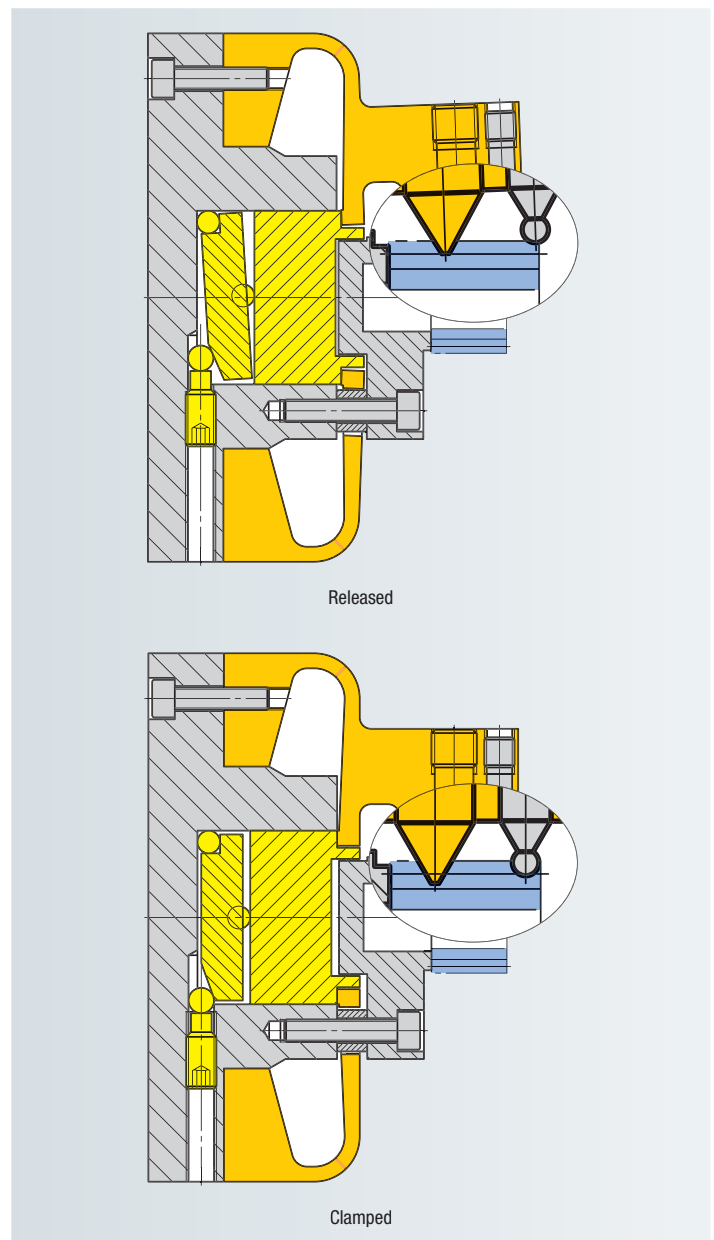
In order to manufacture high precision gear wheels for example, it is very important that the eccentricity between pitch circle and seating bore is very small.

For this purpose the diaphragm clamping system SM is used. For machining the seating bore it allows clamping of the gear wheel at the pitch circle.

The clamping element is a ring disk with primarily three clamping jaws. If the workpiece is thin-walled the diaphragm can also have four or six clamping jaws. These are either carved out of the diaphragm or they are screwed onto it.

By applying an axial force onto the diaphragm, it bends in direction of the force. The clamping jaws simultaneously move axially and open in radial direction. The gear wheel is being released.

Due to its flexibility the diaphragm returns to its initial position if the axial force is reduced or taken away. The gear wheel is being clamped in axial and radial direction.

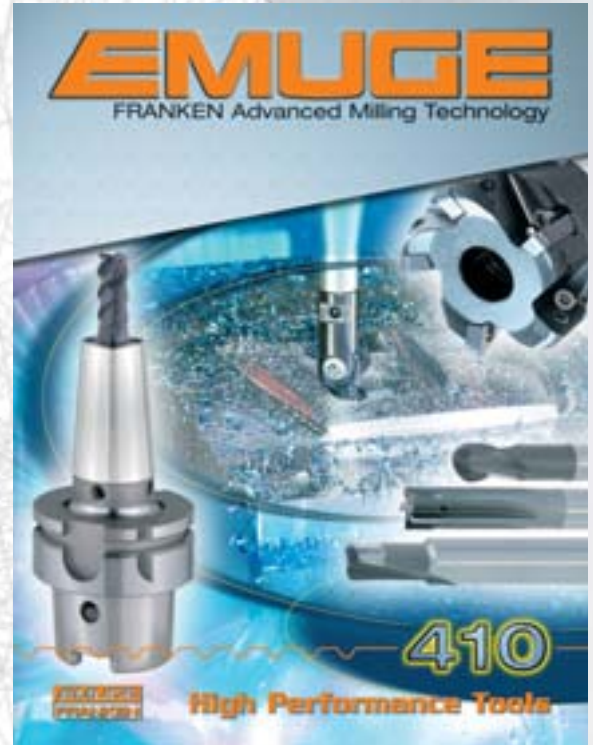




FRANKEN has a 90 year history of milling tool development, and today offers a broad range of solid carbide and HSS milling cutters. The FRANKEN program includes end mills, slot drills, die-sinking cutters, shell mills, gear cutters and highly sophisticated profile cutters that include "Christmas Tree" cutters used in the manufacture of jet engines and power generation turbines.

In addition, FRANKEN has been at the forefront of process and tooling development in the areas of Hard Machining, High Speed Cutting and High Productivity Cutting. Expertise in these areas enabled FRANKEN to develop a complete program for the Mold & Die Industry that includes extra long solid carbide ball and torus end mills, screw-in and shell type cutters with indexable inserts, as well as a complete line of tool holders and tool holding solutions with the SHRINK-MASTER induction shrink-fit system and the powRgrip® tool clamping system.

With this large variety of tool types, the highest production standards and uncompromising precision, the FRANKEN product range will answer the most unyielding quality requirements.



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**Customer Information**

Distributor Name:			End User Name:		
Contact Person:			Contact Person:		
City:	State:	Zip:	Street:		
Phone: ( )	Fax: ( )		City:	State:	Zip:
Customer Inquiry Number:			Phone: ( )	Fax: ( )	

**Tapping Application**

Tap Size:	Class of Fit:	<input type="checkbox"/> Through Hole	<input type="checkbox"/> Blind Hole	<input type="checkbox"/> Other:
Material:	Hardness:	Thread Length:	Thread Length:	
Tap Requirement: <input type="checkbox"/> Cutting <input type="checkbox"/> Forming <input type="checkbox"/> Either			Drill Depth:	
Number of Taps Required:		Number of Holes to Tap:		Repeat Job: <input type="checkbox"/> Yes <input type="checkbox"/> No
Machine Tool	Manufacturer/Type:			Direction of Tapping: <input type="checkbox"/> Horizontal <input type="checkbox"/> Vertical
Feed	<input type="checkbox"/> CNC Controlled <input type="checkbox"/> NC Controlled <input type="checkbox"/> Synchronous Spindle <input type="checkbox"/> Cam Followed <input type="checkbox"/> Lead Screw <input type="checkbox"/> Manual			
Tap Holder	<input type="checkbox"/> Tension/Compression <input type="checkbox"/> Rigid (Collet) <input type="checkbox"/> Floating			Tapping Attachment/Type:
Lubrication	<input type="checkbox"/> Thread Cutting Oil <input type="checkbox"/> Emulsion %: <input type="checkbox"/> Dry <input type="checkbox"/> Other:			
Method	<input type="checkbox"/> Circulation <input type="checkbox"/> Brush <input type="checkbox"/> Mist <input type="checkbox"/> Thru Tap <input type="checkbox"/> Other:			

**Special Design Specifications**

Overall Length:	Shank Diameter:
Pitch Diameter: Min: _____ Max: _____	Gage Limits: Go: _____ No Go: _____

Notes:

*Continue notes on separate sheet if necessary*

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Phone: ( )	Fax: ( )	Street:			
Contact Person:			City:	State:	Zip:
Purchase Order #:			Phone: ( )	Fax: ( )	
Ship Via:			Contact Person:		
End User Reference #:			EMUGE Customer: <input type="checkbox"/> Yes <input type="checkbox"/> No	Needs Catalogs: <input type="checkbox"/> Yes <input type="checkbox"/> No	Needs Engineer: <input type="checkbox"/> Yes <input type="checkbox"/> No

### Tapping Application

Tap Size:	Class of Fit:	<input type="checkbox"/> Through Hole	<input type="checkbox"/> Blind Hole	<input type="checkbox"/> Other:	
Material:	Hardness:	Thread Length:	Thread Length:		
Tap Requirement: <input type="checkbox"/> Cutting <input type="checkbox"/> Forming <input type="checkbox"/> Either	Lubrication:	Drill Depth:			
Machine Tool Manufacturer/Type:	Tap Holder Manufacturer/Type:	Direction of Tapping: <input type="checkbox"/> Horizontal <input type="checkbox"/> Vertical			
Number of Taps in Setup:	Tap Make Presently Used:	Performance/Comments:			
Criteria for a Successful Test:					

### EMUGE Tap Recommendation

Quantity:	EDP#:	Description:	List Price-\$/each:
Speed/SFM:	Tap Drill Size:	Lubrication:	Tap Holder:

EMUGE taps are very free cutting and will easily cut oversize threads if fed out of lead. For the best result, we recommend the use of an EMUGE Quick-Change Tap Holder with built-in tension, compression, and overload clutch features. Always utilize your holder's tension feature by programming spindle feed to 95-98% of the calculated feed rate. CALL AN EMUGE ENGINEER AT THE HOTLINE, 800-323-3013, IF YOU NEED TECHNICAL ASSISTANCE.

### Test Result: Please Fax a Copy Immediately to EMUGE at (508) 595-3650

Tapped Holes: <input type="checkbox"/> Yes <input type="checkbox"/> No	Thread Quality: <input type="checkbox"/> Good <input type="checkbox"/> Poor	Tap Life: <input type="checkbox"/> Long <input type="checkbox"/> Short	Overall Performance: Scale 1 to 10	Tap Life: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Call Me
Comments:				Name: _____ Date: _____
				Phone: _____ Ext. _____ ( )

Continue notes on separate sheet if necessary



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City:	State:	Zip:	Division:		
Phone: ( )	Fax: ( )	Street:			
Contact Person:			City:	State:	Zip:
Purchase Order #:	Date:	Phone: ( )	Fax: ( )		
Ship Via:	To:	Contact Person:			
End User Reference #:	EMUGE Order #:	EMUGE Customer: <input type="checkbox"/> Yes <input type="checkbox"/> No	Needs Catalogs: <input type="checkbox"/> Yes <input type="checkbox"/> No	Needs Engineer: <input type="checkbox"/> Yes <input type="checkbox"/> No	

**Workpiece Data**

Drawing No.:		Title:			
Material:		Hardness:			
Type of Working:	<input type="checkbox"/> Turning	<input type="checkbox"/> Grinding	<input type="checkbox"/> Milling	<input type="checkbox"/> Control	
Operation:	<input type="checkbox"/> Roughing	<input type="checkbox"/> Semifinishing	<input type="checkbox"/> Finishing	<input type="checkbox"/> Other Operations	
Tolerance of Working Diameter:	Errors:	<input type="checkbox"/> Form	<input type="checkbox"/> Geometrical	<input type="checkbox"/> T.I.R.	<input type="checkbox"/> Other

**Machine Data**

Type of Machine:	RPM:	Spindlenose:	Direction of Rotation: <input type="checkbox"/> Left <input type="checkbox"/> Right		
Power Chucking:	Force:	Manual Chucking:			
Feed:	Cut Depth:	Speed-RPM:			
Other Information:					

**Clamping Device**

Chuck:	Mandrel:	Auto Load:	Manual Load:	Load Space:
Clamping Diameter:	Clamp Length:	Max. (Min.) Diameter Opening:	Stop: <input type="checkbox"/> Solid <input type="checkbox"/> Floating	
Other Information:				

**Remarks/Sketch**

*Continue notes on separate sheet if necessary*



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City:	State:	Zip:	Street:
Contact Person:		City:	State: Zip:
Phone: ( )		Contact Person:	
Fax: ( )		Phone: ( ) Fax: ( )	
Purchase Order #:	Date:	EMUGE Customer:	
Ship Via:	To:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Needs Catalogs: <input type="checkbox"/> Yes <input type="checkbox"/> No
End User Reference #:		Needs Engineer: <input type="checkbox"/> Yes <input type="checkbox"/> No	
EMUGE Order #:			

**Tapping Application**

Tap Size:	Machine Tool Type & Mgr:
Class of Fit:	Spindle Connection:
Material:	Tapping Horizontal:
Hardness:	Tapping Vertical:
Through Hole:	Type of Feed:
Thread Length:	Tap Holder Type being Used:
Blind Hole:	Number of Holders in Set Up:
Thread Length:	Tap Presently Used:
Drill Depth:	
Cutting Tap:	
Forming Tap:	

Performance Comments:

Criteria for a Successful Test:

**EMUGE Tap Holder Recommendation**

Quantity:	EDP#:	Description:	List Price-\$/each:

EMUGE taps are very free cutting and will easily cut oversize threads if fed out of lead. For the best result, we recommend the use of an EMUGE Quick-Change Tap Holder with built-in tension, compression, and overload clutch features. Always utilize your holder's tension feature by programming spindle feed to 95-98% of the calculated feed rate. When using Full-Speed taps, Rigid Tapping use KSN-Softsynchro Tap Holders for best results. CALL AN EMUGE ENGINEER AT THE HOTLINE, 800-323-3013, IF YOU NEED TECHNICAL ASSISTANCE.

**Test Result: Please Fax a Copy Immediately to EMUGE at (508) 595-3650**

Comments:	Overall Performance: Scale 1 to 10	Additional Testing Required: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Call Me
		Name: _____ Date: _____
		Phone: _____ Ext. _____ ( )

Continue notes on separate sheet if necessary



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Phone: ( )	Fax: ( )	Street:			
Contact Person:			City:	State:	Zip:
Purchase Order #:	Date:	Phone: ( )	Fax: ( )		
Ship Via:	To:	Contact Person:			
End User Reference #:	EMUGE Order #:	EMUGE Customer: <input type="checkbox"/> Yes <input type="checkbox"/> No	Needs Catalogs: <input type="checkbox"/> Yes <input type="checkbox"/> No	Needs Engineer: <input type="checkbox"/> Yes <input type="checkbox"/> No	

**Thread Milling Application**

Thread Size:	Pitch:	Class of Fit:	Hole Type: <input type="checkbox"/> Through <input type="checkbox"/> Blind
Material:	Hardness:	Thread Length:	Drill Depth:
Machine Tool Manufacturer:		Position of Spindle: <input type="checkbox"/> Vertical <input type="checkbox"/> Horizontal	
Maximum RPM of Spindle:		Type of Controller:	
Coolant System: <input type="checkbox"/> Through Spindle <input type="checkbox"/> External		Type of Shank Connection:	

**EMUGE Recommendation**

Quantity:	EDP#:	Description:	List Price-\$/each:

CALL EMUGE's THREAD MILLING DEPARTMENT IF YOU NEED TECHNICAL ASSISTANCE.

**Remarks/Sketch***Continue notes on separate sheet if necessary*



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City:	State:	Zip:	Division:		
Phone: ( )	Fax: ( )	Street:			
Contact Person:			City:	State:	Zip:
Purchase Order #:	Date:	Phone: ( )	Fax: ( )		
Ship Via:	To:	Contact Person:			
End User Reference #:	EMUGE Order #:	EMUGE Customer: <input type="checkbox"/> Yes <input type="checkbox"/> No	Needs Catalogs: <input type="checkbox"/> Yes <input type="checkbox"/> No	Needs Engineer: <input type="checkbox"/> Yes <input type="checkbox"/> No	

### Mold Milling Application

Machine Type:	Year of Manufacture:	Control Type:			
Maximum RPM of Spindle:	Maximum Feed Rate:	Material:	Hardness:		
Minimum RPM of Spindle:	Minimum Feed Rate:	Tool Holding System:	Programming Method:		

### Test Criteria

Please detail what factors will constitute a successful test:

### Test Tools Recommended

Tool Recommendation:			Recommended Cutting Parameters: <input type="checkbox"/> Inches <input type="checkbox"/> Metric				
Quantity:	EDP#:	Description:	Speed (RPM):	Feed (mm/min):	SFM (m/min):	Depth of Cut:	Chip per tooth:



A		
A0101001	G	100
A0101001	M	72
A0101001	MF	91
A0101051	M	72
A0101051	MF	91
A0102501	G	100
A0102501	M	72
A0102521	M "6GX"	72
A0121001	M	72
A0181000	Rc (BSPT)	107
A0201000	G	100
A0201000	M	73
A0201000	MF	91
A0203000	M	73
A0221000	M	73
A0223000	M	73
A0451000	M	73
A0451000	MF	91
A0463000	G	100
A0463000	M	73
A0463000	MF	91
A0501000	M	74
A0511020	M "ISO 3/6G"	74
A0513500	M	74
AU100501	UNC	28
AU100501	UNF	41
AU109101	UNC	28
AU109101	UNF	41
AU110501	M	70
AU110501	MF	89
AU110601	M	70
AU110601	MF	89
AU201400	M	70
AU201400	MF	89
AU201400	UNC	28
AU201400	UNF	41
AU203000	M	70
AU203000	MF	89
AU203000	UNC	28
AU203000	UNF	41
AU203010	UNC "3B"	28
AU203010	UNF "3B"	41
AU203043	UNC "+.0035"	29
AU203043	UNF "+.0035"	42
AU203044	UNC "+.0050"	29
AU203044	UNF "+.0050"	42
AU306001	UNC	29
AU306001	UNF	42
AU306011	UNC "3BX"	29
AU306011	UNF "3BX"	42
AU456001	UNC	29
AU456001	UNF	42
AU456011	UNC "3BX"	29

AU456011	UNF "3BX"	42
AU461400	M	70
AU461400	MF	89
AU463000	M	71
AU463000	MF	90
AU501400	M	71
AU501400	MF	90
AU503000	M	71
AU503000	MF	90
AU503200	UNC	29
AU503200	UNF	43
AU503210	UNC "3B"	29
AU503210	UNF "3B"	43
AU503243	UNC "+.0035"	29
AU503243	UNF "+.0035"	43
AU503244	UNC "+.0050"	29
AU503244	UNF "+.0050"	43
AU513500	UNC	30
AU513500	UNF	43
AU513510	UNC "3B"	30
AU513510	UNF "3B"	43
AU513700	M	71
AU513700	UNC	30
AU513700	UNF	43
AU513710	UNC "3B"	30
AU513710	UNF "3B"	43
AU921000	M	167
AU921400	M	167
AU921400	UNC	155
AU921400	UNF	161
AW181000	NPT	102
AW181000	NPTF	105
AW181400	NPT	102
AW181400	NPTF	105
AW193000	NPT	102
AW193000	NPTF	105
AW193100	NPT	102
AW193100	NPTF	105
AW483000	NPT	102
AW483000	NPTF	105
AW483100	NPT	103
AW483100	NPTF	106
AW493000	NPT	103
AW493000	NPTF	106
AW493100	NPT	103
AW493100	NPTF	106
AW79J400	NPT	103
AW79J400	NPTF	106
AW889300	NPT	103
AW889300	NPTF	106

B		
B0091400	M	57
B0100501	M	49
B0100501	MF	75

B0101001	M	48
B0101001	MF	75
B0101051	MF	75
B0102501	M	49
B0109101	M	50
B0109401	M	51
B010J601	M	49
B010J901	G	95
B010J901	M	50
B010J901	MF	76
B010K101	G	95
B010K101	M	53
B010K101	MF	78
B010R501	M	48
B010T001	M	49
B011R501	M	48
B0121001	M	48
B016K101	G	95
B016K101	M	53
B016K101	MF	78
B0201000	M	54
B0201000	MF	79
B0201020	M "ISO 3/6G"	54
B0201030	M "7G"	54
B0201050	M	54
B0201400	M	55
B0201400	MF	79
B0203000	LK-M	114
B0203000	M	55
B0203000	MF	79
B0203000	STI-M	111
B0203020	M "ISO 3/6G"	55
B0203020	MF "ISO 3/6G"	80
B0203030	M "7G"	55
B0203701	M	55
B0203701	MF	80
B0204500	M	55
B0204500	STI-M	111
B020C401	M	56
B020C401	MF	80
B020S800	M	55
B020S800	STI-M	111
B0221000	M	54
B0223000	M	55
B0306001	M	57
B0309601	M	57
B030J401	M	57
B0401400	M	57
B0403000	M	58
B040V401	M	59
B041L801	M	59
B0451000	M	57
B0451000	MF	81
B0453701	M	59
B0456001	M	59
B0459601	M	59



B0461400	M	57	B0989501	M	59	B523Q200	M	165
B0463000	M	58	B099C400	M	64	B523S800	M	164
B0463020	M "ISO 3/6G"	58	B1069101	M	50	B523W700	M	165
B046L801	M	59	B1069401	M	51	B529E500	M	165
B0501000	M	61	B1071400	M	163	B531A800	M	166
B0501000	MF	83	B1083701	M	56	B531A800	MF	169
B0501020	M "ISO 3/6G"	61	B1099501	M	49	B531P900	M	166
B0501030	M "7G"	61	B1950501	M	49	B531Q200	M	165
B0501050	M	61	B1950901	M	52	B531S800	M	164
B0501400	M	61	B1950901	MF	77	B5503200	M	65
B0503000	M	61	B1959101	M	50	B5503200	MF	85
B0503000	MF	83	B1959401	M	51	B8170901	M	52
B0503200	M	62	B195R501	M	48	BU083701	UNC	21
B0503200	MF	83	B1969501	M	49	BU083701	UNF	34
B0503500	M	62	B196R501	M	49	BU089300	UNC	20
B0503500	STI-M	112	B1970100	M	163	BU089300	UNF	33
B0503530	M "7G"	63	B1970100	MF	169	BU100501	UNC	18
B0503700	M	63	B1971400	M	163	BU100501	UNF	31
B0504500	M	62	B2100501	M	68	BU109401	UNC	18
B0509400	M	63	B2201000	M	68	BU109401	UNF	31
B050C400	M	64	B2203000	M	68	BU10J901	UNC	18
B050S800	M	62	B2463000	M	68	BU10J901	UNF	31
B050S800	STI-M	112	B2501000	M	69	BU201000	LK-UNC	113
B0513500	LK-M	114	B2503000	M	69	BU201000	UNC	19
B0513500	M	63	B3109401	M	51	BU201000	UNF	32
B0513500	MF	83	B3159401	M	51	BU201010	UNC "3B"	19
B0513500	STI-M	112	B3169401	M	51	BU201010	UNF "3B"	33
B0513520	M "ISO 3/6G"	63	B3179401	M	51	BU201400	UNC	19
B0513520	MF "ISO 3/6G"	84	B3203701	M	56	BU201400	UNF	33
B0513700	M	63	B3223701	M	60	BU201410	UNC "3B"	20
B051C400	M	64	B3233701	M	60	BU201410	UNF "3B"	33
B0601000	M	61	B3253701	M	56	BU201710	UNC "3B"	19
B0603000	M	62	B3503700	M	65	BU201710	UNF "3B"	33
B0653501	M	64	B3553700	M	65	BU203000	UNC	20
B0911000	LK-M	171	B4109401	M	51	BU203000	UNF	33
B0911000	M	162	B4203701	M	57	BU203010	STI-UNC "3B"	109
B0911000	MF	168	B4223701	M	60	BU203010	STI-UNF "3B"	110
B0911020	M "6GX"	162	B4253701	M	60	BU203010	UNC "3B"	20
B0911300	M	162	B438J401	M	59	BU203010	UNF "3B"	33
B0911400	LK-M	171	B4503700	M	65	BU203701	UNC	20
B0911400	M	162	B5207300	M	56	BU203701	UNF	33
B0911400	MF	168	B5207300	MF	80	BU206511	UNC "3BX"	21
B0921000	M	162	B521A800	M	166	BU206511	UNF "3BX"	34
B0921000	MF	168	B521E500	M	165	BU20C401	UNC	21
B0921400	M	163	B521N000	M	164	BU20C401	UNF	34
B0921400	MF	168	B521P300	M	163	BU219401	UNC	18
B0963000	M	58	B521Q200	M	165	BU219401	UNF	31
B0963000	MF	81	B521S800	M	164	BU263701	UNC	24
B0963701	M	60	B521W700	M	165	BU263701	UNF	37
B0969300	M	58	B523A800	M	166	BU293701	UNC	24
B0973500	M	63	B523A800	MF	169	BU293701	UNF	37
B0973500	MF	84	B523E500	M	165	BU306001	UNC	21
B0973700	M	63	B523N000	M	164	BU306001	UNF	35
B0979400	M	64	B523P300	M	163	BU306011	UNC "3BX"	21
B0980101	M	61	B523P300	MF	169	BU306011	UNF "3BX"	35
B0980101	MF	83	B523P900	M	166	BU309611	UNC "3BX"	22



BU309611	UNF "3BX"	35	BU503200	UNF	38	BW553700	UNC	26
BU30J411	UNC "3BX"	22	BU503210	UNC "3B"	25	BW553700	UNF	39
BU30J411	UNF "3BX"	35	BU503210	UNF "3B"	38	BW921400	UNC	150
BU339401	UNC	19	BU50C400	UNC	26	BW921400	UNF	156
BU339401	UNF	32	BU50C400	UNF	39	BW92F000	UNC	151
BU35J411	UNC "3BX"	23	BU513500	LK-UNC	113	BW92F000	UNF	157
BU35J411	UNF "3BX"	36	BU513500	UNC	25	C		
BU37A800	UNC	153	BU513500	UNF	38			
BU37A800	UNF	159	BU513510	STI-UNC "3B"	109			
BU37N000	UNC	152	BU513510	STI-UNF "3B"	110			
BU37N000	UNF	158	BU513510	UNC "3B"	25			
BU37P300	UNC	152	BU513510	UNF "3B"	38			
BU37P300	UNF	158	BU513700	UNC	25			
BU37Q200	UNC	153	BU513700	UNF	39			
BU37Q200	UNF	159	BU519400	UNC	25			
BU37S800	UNC	152	BU519400	UNF	39			
BU37S800	UNF	158	BU51C400	UNC	26			
BU38A800	UNC	153	BU51C400	UNF	39			
BU38A800	UNF	159	BU523701	UNC	23			
BU38N000	UNC	152	BU523701	UNF	37			
BU38N000	UNF	158	BU573701	UNC	23			
BU38P300	UNC	152	BU573701	UNF	37			
BU38P300	UNF	158	BU921000	UNC	150			
BU38P900	UNC	154	BU921000	UNF	156			
BU38P900	UNF	160	BU921400	UNC	150			
BU38Q200	UNC	153	BU921400	UNF	156			
BU38Q200	UNF	159	BU92F000	UNC	151			
BU38S800	UNC	153	BU92F000	UNF	157			
BU38S800	UNF	159	BU931400	UNC	150			
BU39A800	UNC	153	BU931400	UNF	156			
BU39A800	UNF	159	BU939000	UNC	150			
BU44P900	UNC	154	BU939000	UNF	156			
BU44P900	UNF	160	BU94C400	UNC	26			
BU44Q200	UNC	153	BU94C400	UNF	39			
BU44Q200	UNF	159	BU959401	UNC	18			
BU44S800	UNC	153	BU959401	UNF	31			
BU44S800	UNF	159	BU973701	UNC	23			
BU451400	UNC	22	BU973701	UNF	37			
BU451400	UNF	35	BU979300	UNC	22			
BU453000	UNC	22	BU979300	UNF	35			
BU453000	UNF	35	BU999400	UNC	25			
BU453701	UNC	23	BU999400	UNF	39			
BU453701	UNF	36	BW10F000	UNC	151			
BU456001	UNC	23	BW10F000	UNF	157			
BU456001	UNF	36	BW133701	UNC	21			
BU456011	STI-UNC "3BX"	109	BW133701	UNF	34			
BU456011	STI-UNF "3BX"	110	BW159401	UNC	19			
BU456011	UNC "3BX"	23	BW159401	UNF	32			
BU456011	UNF "3BX"	36	BW169401	UNC	19			
BU459611	UNC "3BX"	23	BW169401	UNF	32			
BU459611	UNF "3BX"	36	BW179401	UNC	19			
BU501000	UNC	24	BW179401	UNF	32			
BU501000	UNF	37	BW203701	UNC	21			
BU501010	UNC "3B"	24	BW203701	UNF	34			
BU501010	UNF "3B"	37	BW213701	UNC	21			
BU503200	UNC	24	BW213701	UNF	35			
C								
C0091400	M	57	C0091400	MF	81			
C0091400	MF	81	C0100501	G	96			
C0100501	G	96	C0100501	M	49			
C0100501	M	49	C0100501	MF	75			
C0100501	MF	75	C0101001	G	96			
C0101001	G	96	C0101001	M	48			
C0101001	M	48	C0101001	MF	75			
C0101001	MF	75	C0101001	NPSF	93			
C0101001	NPSF	93	C0101001	NPSM/MPSC	92			
C0101001	NPSM/MPSC	92	C0101001	Rp (BSPP)	94			
C0101001	Rp (BSPP)	94	C0101001	UNEF	44			
C0101001	UNEF	44	C0109101	G	96			
C0109101	G	96	C0109101	M	50			
C0109101	M	50	C0109101	MF	76			
C0109101	MF	76	C0109401	M	51			
C0109401	M	51	C0109401	MF	76			
C0109401	MF	76	C010J601	M	49			
C010J601	M	49	C010J601	MF	75			
C010J601	MF	75	C010J901	G	96			
C010J901	G	96	C010J901	M	50			
C010J901	M	50	C010J901	MF	76			
C010J901	MF	76	C010R501	M	48			
C010R501	M	48	C011R501	M	48			
C011R501	M	48	C0121001	M	48			
C0121001	M	48	C0201000	G	97			
C0201000	G	97	C0201000	M	54			
C0201000	M	54	C0201000	MF	79			
C0201000	MF	79	C0201000	UNEF	44			
C0201000	UNEF	44	C0201020	M "ISO 3/6G"	54			
C0201020	M "ISO 3/6G"	54	C0201020	MF "ISO 3/6G"	79			
C0201020	MF "ISO 3/6G"	79	C0201030	M "7G"	54			
C0201030	M "7G"	54	C0201050	M	54			
C0201050	M	54	C0201050	MF	79			
C0201050	MF	79	C0201400	G	97			
C0201400	G	97	C0201400	M	55			
C0201400	M	55	C0201400	MF	79			
C0201400	MF	79	C0203000	G	97			
C0203000	G	97	C0203000	LK-M	114			
C0203000	LK-M	114	C0203000	M	55			
C0203000	M	55	C0203000	MF	79			
C0203000	MF	79	C0203000	STI-M	111			
C0203000	STI-M	111	C0203020	M "ISO 3/6G"	55			
C0203020	M "ISO 3/6G"	55	C0203020	MF "ISO 3/6G"	80			
C0203020	MF "ISO 3/6G"	80	C0203030	M "7G"	55			
C0203030	M "7G"	55	C0203701	M	55			
C0203701	M	55	C0203701	MF	80			
C0203701	MF	80						



C0204500	M	55	C0513500	NPSM/MPSC	92	C1950501	M	49
C0204500	STI-M	111	C0513500	Rp (BSP)	94	C1950501	MF	75
C020C401	M	56	C0513500	STI-M	112	C1950901	M	52
C020C401	MF	80	C0513520	M "ISO 3/6G"	63	C1950901	MF	77
C020S800	M	55	C0513520	MF "ISO 3/6G"	84	C1959101	M	50
C020S800	STI-M	111	C0513700	G	98	C1959101	MF	76
C0221000	M	54	C0513700	M	63	C1959401	M	51
C0223000	M	55	C0513700	MF	84	C1959401	MF	77
C0306001	M	57	C0513700	NPSF	93	C195R501	M	48
C0309601	M	57	C0513700	NPSM/MPSC	92	C1960901	G	96
C030J401	M	57	C051C400	M	64	C196R501	M	49
C0401400	G	97	C051C400	MF	84	C1970100	M	163
C0401400	M	57	C053C401	M	67	C1970100	MF	169
C0401400	MF	81	C053C401	MF	88	C1971400	M	163
C0403000	M	58	C0601000	M	61	C1971400	MF	168
C0451000	G	97	C0603000	M	62	C2100501	M	68
C0451000	M	57	C0653501	M	64	C2201000	M	68
C0451000	MF	81	C0653501	MF	85	C2203000	M	68
C0453701	M	59	C0803001	G	99	C2463000	M	68
C0453701	MF	82	C0803001	M	66	C2501000	M	69
C0456001	M	59	C0803001	MF	86-87	C2503000	M	69
C0459601	M	59	C0803101	G	99	C3109401	M	51
C0461400	M	57	C0803101	M	66	C3109401	MF	77
C0463000	G	97	C0803101	MF	86-87	C3159401	M	51
C0463000	M	58	C0911000	G	170	C3159401	MF	77
C0463000	MF	81	C0911000	M	162	C3169401	M	51
C0463000	UNEF	44	C0911000	MF	168	C3169401	MF	77
C0463020	M "ISO 3/6G"	58	C0911400	G	170	C3179401	M	51
C0501000	G	98	C0911400	M	162	C3179401	MF	77
C0501000	M	61	C0911400	MF	168	C3203701	M	56
C0501000	MF	83	C0921000	M	162	C3203701	MF	81
C0501000	UNEF	44	C0921000	MF	168	C3223701	M	60
C0501020	M "ISO 3/6G"	61	C0921400	G	170	C3223701	MF	82
C0501030	M "7G"	61	C0921400	M	163	C3233701	M	60
C0501050	M	61	C0921400	MF	168	C3233701	MF	83
C0501050	MF	83	C0963000	M	58	C3253701	M	56
C0501400	G	98	C0963000	MF	81	C3253701	MF	81
C0501400	M	61	C0963701	M	60	C3503700	M	65
C0501400	MF	83	C0963701	MF	82	C3503700	MF	85
C0503000	G	98	C0969300	M	58	C3553700	M	65
C0503000	M	61	C0973500	M	63	C3553700	MF	85
C0503000	MF	83	C0973500	MF	84	C406C401	M	67
C0503200	M	62	C0973700	M	63	C406C401	MF	88
C0503200	MF	83	C0973700	MF	84	C4109401	M	51
C0503500	M	62	C0979400	M	64	C4109401	MF	77
C0503500	STI-M	112	C0980101	M	61	C4203701	M	57
C0503530	M "7G"	63	C0980101	MF	83	C4203701	MF	81
C0503700	M	63	C099C400	M	64	C4223701	M	60
C0509400	M	63	C1069101	M	50	C4223701	MF	82
C050C400	M	64	C1069101	MF	76	C4253701	M	60
C050S800	STI-M	112	C1069401	M	51	C4253701	MF	82
C0513500	G	98	C1069401	MF	77	C428C401	M	67
C0513500	LK-M	114	C1071400	M	163	C428C401	MF	88
C0513500	M	63	C1071400	MF	169	C438J401	M	59
C0513500	MF	83	C1083701	M	56	C4503700	M	65
C0513500	NPSF	93	C1083701	MF	80	C4513700	MF	85



C5207300	M	56	CU306011	UNC "3BX"	21	CU501000	UNF	37
C5207300	MF	80	CU306011	UNF "3BX"	35	CU501010	UNC "3B"	24
C521A800	M	166	CU309611	UNC "3BX"	22	CU501010	UNF "3B"	37
C521P300	M	163	CU309611	UNF "3BX"	35	CU503200	UN-8	46
C523A800	M	166	CU30J411	UNC "3BX"	22	CU503200	UNC	24
C523A800	MF	169	CU30J411	UNF "3BX"	35	CU503200	UNF	38
C523P300	M	163	CU339401	UNC	19	CU503210	UN-8 "3B"	46
C523P300	MF	169	CU339401	UNF	32	CU503210	UNC "3B"	25
C531A800	M	166	CU35J411	UNC "3BX"	23	CU503210	UNF "3B"	38
C531A800	MF	169	CU35J411	UNF "3BX"	36	CU503500	UN-8	46
C5503200	M	65	CU37A800	UNC	153	CU503500	UNC	25
C5503200	MF	85	CU37A800	UNF	159	CU503500	UNF	38
CU083701	UNC	21	CU37N000	UNC	152	CU503700	UN-8	46
CU083701	UNF	34	CU37N000	UNF	158	CU503700	UNC	25
CU089300	UNC	20	CU37P300	UNC	152	CU503700	UNF	39
CU089300	UNF	33	CU37P300	UNF	158	CU509400	UN-8	46
CU100501	UN-8	45	CU37Q200	UNC	153	CU50C400	UNC	26
CU100501	UNC	18	CU37Q200	UNF	159	CU50C400	UNF	39
CU100501	UNF	31	CU37S800	UNC	152	CU513500	LK-UNC	113
CU109401	UNC	18	CU37S800	UNF	158	CU513500	UNC	25
CU109401	UNF	31	CU38A800	UNC	153	CU513500	UNF	38
CU10J901	UNC	18	CU38A800	UNF	159	CU513510	STI-UNC "3B"	109
CU10J901	UNF	31	CU38N000	UNC	152	CU513510	STI-UNF "3B"	110
CU201000	LK-UNC	113	CU38N000	UNF	158	CU513510	UNC "3B"	25
CU201000	UNC	19	CU38P300	UNC	152	CU513510	UNF "3B"	38
CU201000	UNF	32	CU38P300	UNF	158	CU513700	UNC	25
CU201010	UNC "3B"	19	CU38P900	UNC	154	CU513700	UNF	39
CU201010	UNF "3B"	33	CU38P900	UNF	160	CU519400	UNC	25
CU201400	UNC	19	CU38Q200	UNC	153	CU519400	UNF	39
CU201400	UNF	33	CU38Q200	UNF	159	CU51C400	UNC	26
CU201410	UNC "3B"	20	CU38S800	UNC	153	CU51C400	UNF	39
CU201410	UNF "3B"	33	CU38S800	UNF	159	CU573701	UN-8	45
CU201710	UNC "3B"	19	CU39A800	UNC	153	CU573701	UNC	23
CU201710	UNF "3B"	33	CU39A800	UNF	159	CU573701	UNF	37
CU203000	UN-8	45	CU44P900	UNC	154	CU583701	UN-8	45
CU203000	UNC	20	CU44P900	UNF	160	CU583701	UNC	23
CU203000	UNF	33	CU44Q200	UNC	153	CU583701	UNF	37
CU203010	STI-UNC "3B"	109	CU44Q200	UNF	159	CU803001	UN-8	47
CU203010	STI-UNF "3B"	110	CU44S800	UNC	153	CU803001	UNC	27
CU203010	UNC "3B"	20	CU44S800	UNF	159	CU803001	UNF	40
CU203010	UNF "3B"	33	CU451400	UNC	22	CU803011	UN-8 "3BX"	47
CU203701	UNC	20	CU451400	UNF	35	CU803011	UNC "3BX"	27
CU203701	UNF	33	CU453000	UNC	22	CU803011	UNF "3BX"	40
CU206511	UNC "3BX"	21	CU453000	UNF	35	CU921000	UNC	150
CU206511	UNF "3BX"	34	CU453701	UNC	23	CU921000	UNF	156
CU209300	UN-8	45	CU453701	UNF	36	CU921400	UNC	150
CU20C401	UNC	21	CU456001	UN-8	45	CU921400	UNF	156
CU20C401	UNF	34	CU456001	UNC	23	CU92F000	UNC	151
CU219401	UNC	18	CU456001	UNF	36	CU92F000	UNF	157
CU219401	UNF	31	CU456011	STI-UNC "3BX"	109	CU94C400	UNC	26
CU263701	UNC	24	CU456011	STI-UNF "3BX"	110	CU94C400	UNF	39
CU263701	UNF	37	CU456011	UNC "3BX"	23	CU959401	UNC	18
CU293701	UNC	24	CU456011	UNF "3BX"	36	CU959401	UNF	31
CU293701	UNF	37	CU459611	UNC "3BX"	23	CU973701	UNC	23
CU306001	UNC	21	CU459611	UNF "3BX"	36	CU973701	UNF	37
CU306001	UNF	35	CU501000	UNC	24	CU979300	UNC	22



CU979300	UNF	35	F090...	DEU	430	GF162126	G, Rp (BSPP), W	232
CU999400	UNC	25	F090...	TORCO-FIX	427	GF162131	G, Rp (BSPP), W	232
CU999400	UNF	39	F091...	VEU	431	GF162136	G, Rp (BSPP), W	232
CW10F000	UNC	151	F092...	AEU	430	GF162151	G, Rp (BSPP), W	232
CW10F000	UNF	157	F093...	VS	430	GF162156	G, Rp (BSPP), W	232
CW133701	UNC	21	F094...	DS/ER	420	GF162211	G, Rp (BSPP), W	232
CW133701	UNF	34	F094...	ER	416-417	GF162216	G, Rp (BSPP), W	232
CW159401	UNC	19	F094...	ER-GB	414-415	GF162311	M, MF	226
CW159401	UNF	32	F094...	Hi-Q/ER	423	GF162311	UN	223
CW169401	UNC	19	F094...	Hi-Q/ERBC	424	GF162316	M, MF	226
CW169401	UNF	32	F094...	Hi-Q/ERC	423	GF162316	UN	223
CW179401	UNC	19	F094...	Hi-Q/ERM	422	GF162321	M, MF	226
CW179401	UNF	32	F094...	Hi-Q/ERMC	422	GF162321	UN	223
CW181000	NPT	101	F094...	KS/ER	421	GF162326	M, MF	226
CW181000	NPTF	104	F094...	PCM ET1	418-419	GF162326	UN	223
CW181400	NPT	101	F094...	PGR-GB	434	GF162331	M, MF	226
CW181400	NPTF	104	F211...	SFM-NP	371-372	GF162331	UN	223
CW193000	NPTF	104	F310...	KSN/HD	339-348	GF162336	M, MF	226
CW193100	NPTF	104	F313...	KSN/Synchro	354-357	GF162336	UN	223
CW203701	UNC	21	F315...	Softsynchro®	302-319, 425	GF162351	M, MF	226
CW203701	UNF	34	F322...	Softsynchro®/PGR	320-321	GF162351	UN	223
CW213701	UNC	21	F323...	KSN/HD/ER	349-351, 426	GF162356	M, MF	226
CW213701	UNF	35	F324...	KSN/HD/PGR	352-353	GF162356	UN	223
CW483000	NPT	101	F330...	KSN	324-338	GF163101	M, MF	225
CW483100	NPT	101	F330...		412-413	GF163106	M, MF	225
CW493000	NPT	101	F335...	SPEEDSYNCHRO®	381-382	GF163121	LK-M, LK-MF	234
CW493100	NPT	101	F338...	SWITCH-MASTER®	378-379	GF163121	M, MF	225
CW553700	UNC	26	F339...	GRN-NC	380	GF163121	UN	222
CW553700	UNF	39	F347...	KSN/MQL	363-364	GF163126	LK-M, LK-MF	234
CW92F000	UNC	151	F348...	KSN/MQL	365	GF163126	M, MF	225
CW92F000	UNF	157	F349...	Softsynchro®/MMS	360-361	GF163126	UN	222
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			F351...	Softsynchro®/MMS	362	GF163131	LK-M, LK-MF	234
			F356...	EM/PGR/IKZ	406	GF163131	M, MF	225
			F449...	EM/MQL	366	GF163131	UN	222
			F656...	EM-S	408	GF163136	G, Rp (BSPP), W	231
			F658...	EM-LS	409	GF163136	LK-M, LK-MF	234
			FZ111300		117	GF163136	M, MF	225
			FZ111310		118	GF163136	UN	222
			FZ111900		116	GF163151	G, Rp (BSPP), W	231
			FZ112000		120	GF163151	LK-M, LK-MF	234
			FZ112030		120	GF163151	M, MF	225
			FZ112100		120	GF163151	UN	222
			FZ112110		120	GF163156	G, Rp (BSPP), W	231
			FZ112320		116	GF163156	LK-M, LK-MF	234
			FZ112600		117	GF163156	M, MF	225
			FZ112610		118	GF163156	UN	222
			FZ131500		119	GF163211	G, Rp (BSPP), W	231
			FZ131510		119	GF163211	LK-M, LK-MF	234
			FZ191900		115	GF163211	M, MF	225
						GF163211	UN	222
						GF163216	G, Rp (BSPP), W	231
						GF163216	LK-M, LK-MF	234
						GF163216	M, MF	225
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GF172106	NPSF	233	GF322106	G	216	GF442256	M	195
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GF172131	NPSF	233	GF322106	UNC	208	GF603111	UN	251
GF172136	NPSF	233	GF322106	UNF	210	GF603117	G, BSW, BSF, W	251
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GF173106	NPTF	239	GF332106	M	212	GF613121	M, MF	253
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GF173111	Rc (BSPT)	241	GF333101	LK-M	217	GF641207	M, MF	261
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GF173131	NPTF	239	GF335106	UNF	211	GF643007	G, BSW, BSF, W	257
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GF173136	Rc (BSPT)	241	GF342101	UNC	208	GF643107	G, BSW, BSF, W	259
GF173151	NPT	237	GF342106	M	212	GF643107	NPT	259
GF173151	NPTF	239	GF342106	UNC	208	GF643107	UN, M, MF	259
GF173151	Rc (BSPT)	241	GF422201	M	194	GF643205	G, BSW, BSF, W	261
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GF173156	NPTF	239	GF422201	STI-M	197	GF643207	G, BSW, BSF, W	261
GF173156	Rc (BSPT)	241	GF422201	UNC	192	GF643207	NPT	261
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GF175301	NPTF	240	GF422206	M	194	GF643305	G, BSW, BSF, W	263
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