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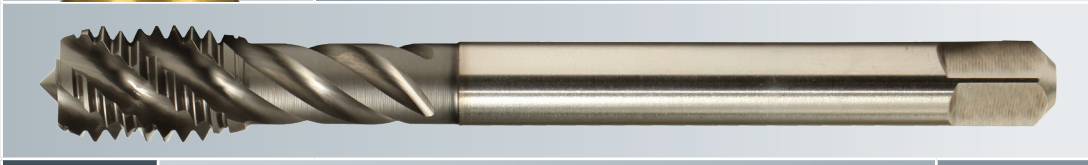
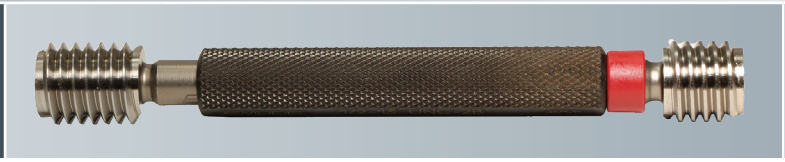
EMUGE FRANKEN

NEW Thread Mills & Gages





EMUGE SELF LOCK™

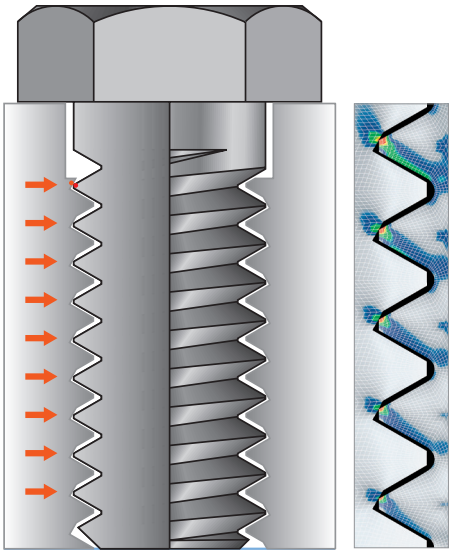
INTEGRATED THREAD LOCKING TOOLS

SELF-LOCK™ EMUGE Thread Locking Technology.

A proven thread design, Emuge SELF-LOCK Threading Tools have been successfully working in thousands of safety critical manufacturing applications.

In an ideal screw connection for high-stress situations, where there is a standard external thread in an EMUGE SELF-LOCK internal thread, the internal thread yields a self-locking screw connection that can be used repeatedly. The special profile of the SELF-LOCK thread allows an even distribution of stress over the entire thread length and therefore eliminates slippage.

EMUGE SELF-LOCK Screw Connection

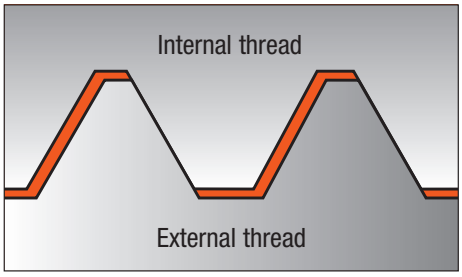


Shows even distribution of force over the entire length of the thread

EMUGE Thread Locking at Work

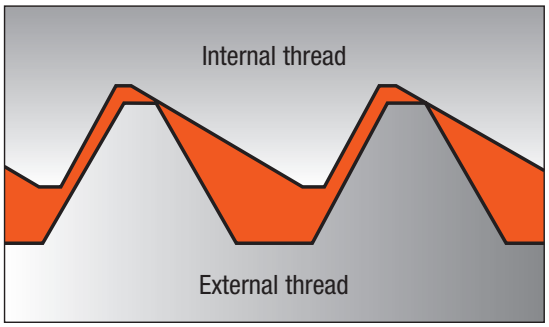
- The thread locking feature is integrated in the internal thread
- Modified profile with ramp surface in the direction of stress
- 30 degree ramp surface provides self-locking effect
- Easy assembly
- No assembly errors possible (forgetting the locking device)
- Use of standard external threads (screws) with tolerance class “medium”
- Even distribution of stress over the entire thread length
- **No stripping of threads**
- Economically efficient locking system, no additional components are necessary
- Constant, maximum holding power even under dynamic stress
- Repeated loosening and re-tightening without loss of function
- Internal threads can be produced with EMUGE taps, cold forming taps or thread mills
- Larger thread hole diameters – increased tool life for threading tools
- Larger tolerances for thread hole diameters

Standard thread

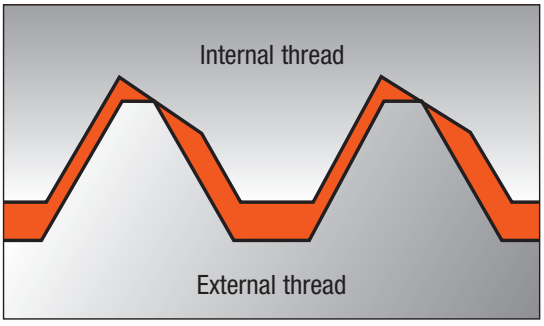


EMUGE SELF-LOCK™ Threads

Saw-tooth profile up to pitch P ≤ 0.7 mm



Standard profile from pitch P > 0.7 mm

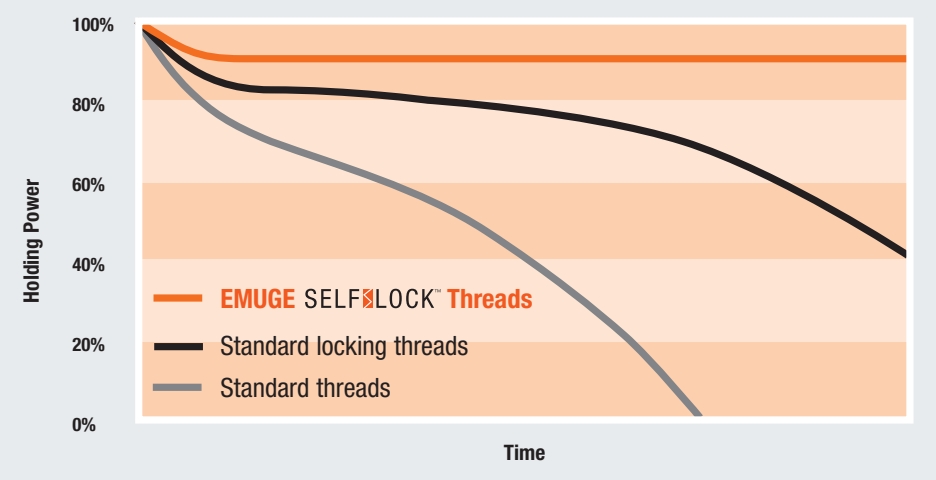


Put a Lock on Your Safety Critical Threading Applications

Now EMUGE's legendary thread making tool quality is available in an integrated thread locking system; SELF-LOCK. Our special SELF-LOCK threading tools offer a high quality alternative in thread locking for applications in aerospace, medical, communications, transportation industries, and more.

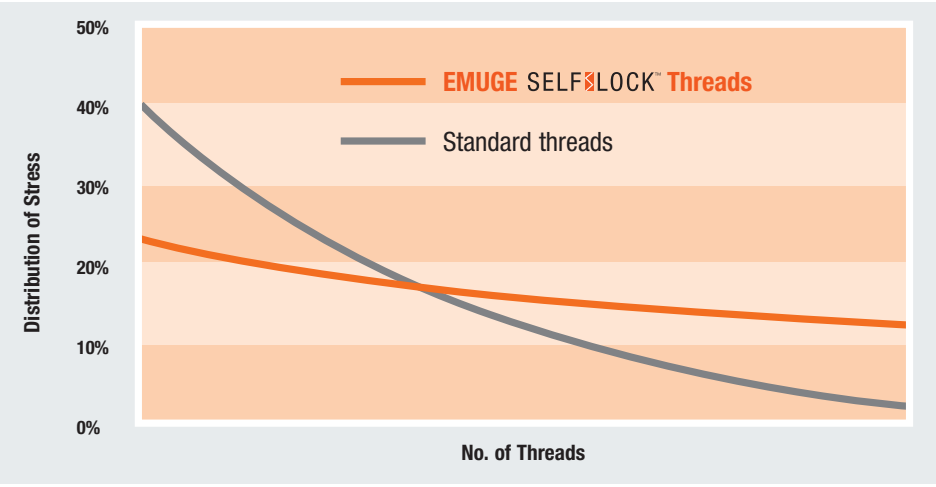
Holding power comparison in relation to time

Compared with standard threads, the **EMUGE SELF-LOCK internal thread shows constant, maximum holding power under dynamic stress.** This remains true even after repeated loosening and re-tightening of the thread connection. This locking effect is caused by the ramp-shaped surface integrated into the thread profile.



Load distribution comparison over the thread length

The concentration of the tightening force on the first few threads of a standard thread often leads to stripping of the nut thread, especially in soft workpiece materials. The special design of the **EMUGE SELF-LOCK internal thread creates an even distribution of stress over the entire thread length.** The first thread which is normally the most exposed to the danger of stripping is relieved, while the deeper, less exposed threads bear more of the natural stress.



Designation of EMUGE SELF-LOCK Threading tools

The EMUGE SELF-LOCK profile is designated by the letters “LK”. They are always printed before the thread size.
The abbreviation BT or TT is appended to the thread denomination.

The choice of a suitable tap type for blind BT or through holes TT must be made independent of that.

Example: **EMUGE SELF-LOCK blind hole tap M8):**
EMUGE – 2 Enorm LK-M8 BT

Example: **EMUGE SELF-LOCK through hole tap M8 x 0.75 with screw-in direction opposed to thread direction:**
EMUGE – Rekord 1B LK-M8 x 0.75 TT

The design of a thread milling cutter is specified according to the required functions (drilling, countersinking, thread milling).

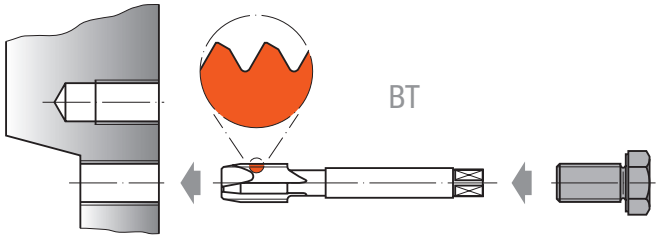
Example: **EMUGE GSF – M8 - 2xD):**
EMUGE – GSF LK-M8-2xD BT

Example: **EMUGE GSF – M8 - 2xD with screw-in direction opposed to thread direction):**
EMUGE – GSF LK-M8-2xD TT

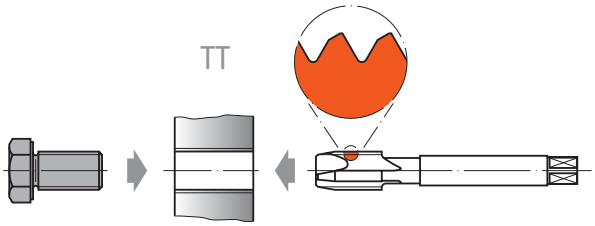
Specifying the direction of ramp surfaces

The ramp surfaces must be inclined in the screw-in, i.e., the load direction.

Ramp surface direction: Backwards
Designation: Back Taper
Abbreviation: BT
Application case:
- Blind hole threads
- Through hole threads with screw-in direction equal to thread cutting direction



Ramp surface direction: Forwards
Designation: Top Taper
Abbreviation: TT
Application case:
- Through hole threads with opposite screw-in and cutting direction



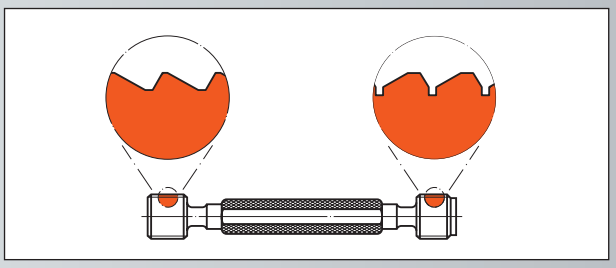
Gaging EMUGE SELF-LOCK Threads

EMUGE recommends using their two-piece gage system which corresponds to the usual combination of GO and NO-GO gage and is perfectly sufficient for gaging of threads, provided that the LK threads were produced with EMUGE true-to-profile taps.

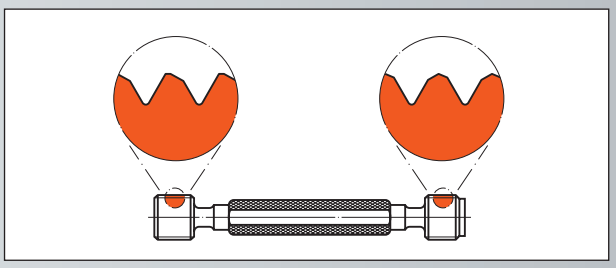
There is no generally applicable standard (e.g. DIN standard) for EMUGE SELF-LOCK threads, so other manufacturers may use different limit sizes for their threads. For this reason, **Emuge recommends gaging EMUGE SELF-LOCK threads exclusively with EMUGE SELF-LOCK gages.**

Gaging of saw-tooth profiles work on the same principle, the only difference being GO and NO-GO plug gages have to be used in the correct direction.

Thread plug gage GO/NO-GO P ≤ 0.7 mm

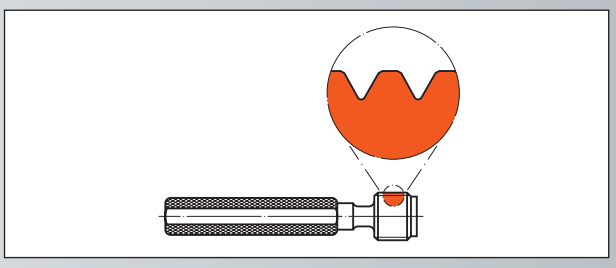


Thread plug gage GO/NO-GO P > 0.7 mm



Wherever threads are produced by chasing or thread milling, we recommend the additional use of our **EMUGE HRPG gage** which checks the lower end of the ramp, and helps to identify any deviations in the angle of the ramp.

NO-GO plug gage HRPG P > 0.7 mm



Product finder and cutting data

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

Coating:

GLT-1 (black-grey) PVD coating has a unique anti-friction property that results in improved tool life, reduced torque, optimized chip evacuation and superior thread finish.

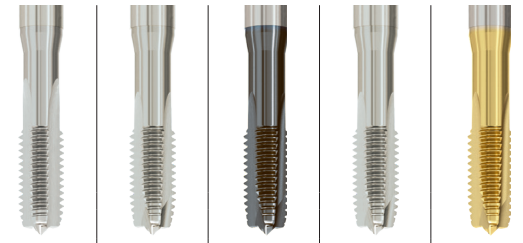
TICN - Titanium carbo-nitride (blue-grey) a multi-layer PVD coating with carbon added for increased edge hardness & surface lubricity.

TIN - Titanium nitride (gold) is a general purpose PVD coating for edge hardness and surface lubricity.

NT (silver) Nitrited to increase hardness and corrosion resistance.

TIALN-T46 - Multi-layer TIALN based coating (black-grey) for heat and wear resistance.

Taps



				Page	12	10	10	12	12
				Tool Name	**Rekord A-GG NT**	**Rekord B STEEL**	**Rekord B-Z PM GLT-1**	**Rekord B-VA NT**	**Rekord B-VA TIN**
				Thread	Metric	UNC/UNF	UNC/UNF	Metric	Metric
				Style	DIN/DIN	DIN/ANSI	DIN/ANSI	DIN/DIN	DIN/DIN
				Coating	NT	Bright	GLT-1	NT	TIN
				Type	Semi-Bottoming	Plug	Plug	Plug	Plug
	Applications – Materials		**Hardness Range**	**Specific Material Grade**	**Chamfer**	C / 2-3	B / 4-5	B / 4-5	B / 4-5	B / 4-5
P		**Steel materials**								
	1.1	Cold-extrusion steels, Construction steels, Free-cutting steels, etc.	≤ 600 N/mm 2	Cq15	1.1132			49 - 148		49 - 148
				S235 7-2)	1.0037					
				10SPb20	1.0722					
	2.1	Construction steels, Cementation steels, Steel castings, etc.	≤ 800 N/mm 2	E360 (St70-2)	1.0070		16 - 66	33 - 131	16 - 66	33 - 131
				16MnCr5	1.7131					
				GS-25CrMo4	1.7218					
	3.1	Cementation steels, Heat-treatable steels, Cold work steels, etc.	≤ 1000 N/mm 2	20MoCr3	1.7320		7 - 49	16 - 82	7 - 49	16 - 82
				42CrMo4	1.7225					
				102Cr6	1.2067					
	4.1	Heat-treatable steels, Cold work steels, Nitriding steels, etc.	≤ 1200 N/mm 2	50CrMo4	1.7228			16 - 49		16 - 49
				X45NiCrMo4	1.2767					
				31CrMo12	1.8515					
	5.1	High-alloyed steels, Cold work steels, Hot work steels, etc.	≤ 1400 N/mm 2	X38CrMoV5-3	1.2367					
				X100CrMoV8-1-1	1.2990					
				X40CrMoV5-1	1.2344					
M		**Stainless steel materials**								
	1.1	Ferritic, martensitic	≤ 950 N/mm 2	X2CrTi12	1.4512			16 - 40		
	2.1	Austenitic	≤ 950 N/mm 2	X6CrNiMoTi17-12-2	1.4571			7 - 26		
	3.1	Austenitic-ferritic (Duplex)	≤ 1100 N/mm 2	X2CrNiMoN22-5-3	1.4462			7 - 26		
	4.1	Austenitic-ferritic heat-resistant (Super Duplex)	≤ 1250 N/mm 2	X2CrNiMoN25-7-4	1.4410			7 - 26		
K		**Cast materials**								
	1.1	Cast iron with lamellar graphite (GJL)	100 - 250 N/mm 2	EN-GJL-200 (GG20)	EN-JL-1030	33 - 82				
	1.2		250 - 450 N/mm 2	EN-GJL-300 (GG30)	EN-JL-1050	33 - 66				
	2.1	Cast iron with nodular graphite (GJS)	350 - 500 N/mm 2	EN-GJS-400-15 (GGG40)	EN-JS-1030					
	2.2		500 - 900 N/mm 2	EN-GJS-700-2 (GGG70)	EN-JS-1070					
	3.1	Cast iron with vermicular graphite (GJV)	300 - 400 N/mm 2	GJV 300						
	3.2		400 - 500 N/mm 2	GJV 450						
	4.1	Malleable cast iron (GTMW, GTMB)	250 - 500 N/mm 2	EN-GJMW-350-4 (GTW-35)	EN-JM-1010					
	4.2		500 - 800 N/mm 2	EN-GJMB-450-6 (GTS-45)	EN-JM-1140					
N		**Non ferrous materials**								
		Aluminum alloys								
	1.1	Aluminum wrought alloys	≤ 200 N/mm 2	EN AW-AlMn1	EN AW-3103					
	1.2		≤ 350 N/mm 2	EN AW-AlMgSi	EN AW-6060					
	1.3		≤ 550 N/mm 2	EN AW-AlZn5Mg3Cu	EN AW-7022					
	1.4	Aluminum cast alloys Si ≤ 7%	Si ≤ 7%	EN AC-AlMg5	EN AC-51300					
	1.5	Aluminum cast alloys 7% < Si ≤ 12%	7% < Si ≤ 12%	EN AC-AlSi9Cu3	EN AC-46500					
	1.6	Aluminum cast alloys 12% < Si ≤ 17%	12% < Si ≤ 17%	GD-AlSi17Cu4FeMg						
		Copper alloys								
	2.1	Pure copper, low-alloyed copper	≤ 400 N/mm 2	E-Cu 57	EN CW 004 A					
	2.2	Copper-zinc alloys (brass, long-chipping)	≤ 550 N/mm 2	CuZn37 (Ms63)	EN CW 508 L		33 - 131	33 - 131	33 - 131	
	2.3	Copper-zinc alloys (brass, short-chipping)	≤ 550 N/mm 2	CuZn36Pb3 (Ms58)	EN CW 603 N					
	2.4	Copper-aluminum alloys (alu bronze, long-chipping)	≤ 800 N/mm 2	CuAl10Ni5Fe4	EN CW 307 G					
	2.5	Copper-tin alloys (tin bronze, long-chipping)	≤ 700 N/mm 2	CuSn8P	EN CW 459 K		7 - 33		7 - 33	
	2.6	Copper-tin alloys (tin bronze, short-chipping)	≤ 400 N/mm 2	CuSn7 ZnPb (Rg7)	2.1090					
	2.7	Special copper alloys	≤ 600 N/mm 2	(Amcoo 8)						
	2.8		≤ 1400 N/mm 2	(Ampco 45)						
		Magnesium alloys								
	3.1	Magnesium wrought alloys	≤ 500 N/mm 2	MgAl6Zn	3.5612					
	3.2	Magnesium cast alloys	≤ 500 N/mm 2	EN-MCMgAl9Zn1	EN-MC21120					
		Synthetics								
	4.1	Duroplastics (short-chipping)		Bakelit, Pertinax						
	4.2	Thermoplastics (long-chipping)		PMMA, POM, PVC						
	4.3	Fiber-reinforced synthetics (fiber content ≤ 30%)		GFK, CFK, AFK						
	4.4	Fiber-reinforced synthetics (fiber content > 30%)		GFK, CFK, AFK						
		Special materials								
	5.1	Graphite		C 8000						
	5.2	Tungsten-copper alloys		W-Cu 80/20						
	5.3	Composite materials		Hylite, Alucobond						
S		**Special materials**								
		Titanium alloys								
	1.1	Pure titanium	≤ 450 N/mm 2	Ti1	3.7025					
	1.2	Titanium alloys	≤ 900 N/mm 2	TiAlT4	3.7165					
	1.3		≤ 1250 N/mm 2	TiAl4Mo4Sn2	3.7185					
		Nickel alloys, cobalt alloys and iron alloys								
	2.1	Pure nickel	≤ 600 N/mm 2	Ni 99,6	2.4060					
	2.2	Nickel-base alloys	≤ 1000 N/mm 2	Monel 400	2.4360					
	2.3		≤ 1600 N/mm 2	Inconel 718	2.4668					
	2.4	Cobalt-base alloys	≤ 1000 N/mm 2	Incoloy 800						
	2.5		≤ 1600 N/mm 2	Haynes 25	2.4964					
	2.6	Iron-base alloys	≤ 1500 N/mm 2	Incoloy 925	1.4958					
H		**Hard materials**								
	1.1	High strength steels, hardened steels, hard castings	44 - 50 HRC	Weldox 1100						
	1.2		50 - 55 HRC	Hardox 550						
	1.3		55 - 60 HRC	Armox 600T						
	1.4		60 - 63 HRC	Ferro-Titanit						
	1.5		63 - 66 HRC	HSSE						

Cutting speed v_c in SFM

	Taps				Form Taps			Thread Mills						
												NEW 	
	11	10	11, 12	11	12	12	11	13	13	13	13	9	Page
	Rekord D-Ti TICN	**Rekord C-Ti TICN**	**Enorm Z/E**	**Enorm Z/E GLT-1**	**Drück STEEL TIN**	**Drück STEEL SN TIN**	**Drück STEEL /E-SN TIN-T1**	**GSF**		**GF**		**LK ZGF-S-Cut**	**Tool Name**
								uncoated	TICN	uncoated	TICN		
	UNC/UNF	UNC/UNF	UNC/UNF, Metric	UNC/UNF	Metric	Metric	UNC/UNF	Metric				UNC/UNF	Thread
	DIN/ANSI	DIN/ANSI	DIN/DIN	DIN/ANSI	DIN/DIN	DIN/DIN	DIN/ANSI	–				–	Style
	TiCN	TiCN	Bright	GLT-1	TIN	TIN	TIN-TI	uncoated	TICN	uncoated	TICN	TIALN-T46	Coating
	Semi-Bottoming	Plug	Bottoming	Bottoming	Semi-Bottoming	Sem-Bottoming	Bottoming	GSF & GF		GSF, GF & ZGF-S-Cut Feed per tooth fz		Bottoming	Type
	C / 2-3	C / 2-3	E / 1.5-2	E / 1.5-2	C / 2-3	C / 2-3	E / 1.5-2			ø d ≤ .1575	ø d ≤ .3150 ø d > .3150		
			16 - 82		49 - 148	49 - 148	49 - 148	207 - 384	413 - 768	.0002-.0016	.0016-.0028 .0020-.0059	262 - 820	1.1
			16 - 66		33 - 131	33 - 131	33 - 131	174 - 321	344 - 640	.0002-.0016	.0016-.0028 .0020-.0059	197 - 492	2.1
			7 - 49		33 - 82	33 - 82	33 - 82	138 - 256	276 - 512	.0002-.0012	.0012-.0020 .0016-.0047	131 - 394	3.1
	16 - 66	16 - 66						115 - 213	230 - 426	.0001-.0008	.0008-.0020 .0016-.0047	131 - 394	4.1
	7 - 33	7 - 33						92 - 171	184 - 341	.0001 .0008	.0008-.0020 .0016-.0047	131 - 394	5.1
									207 - 384	.0001-.0012	.0012-.0020 .0016-.0047	131 - 394	1.1
									207 - 384	.0001-.0012	.0012-.0020 .0016-.0047	131 - 394	2.1
	16 - 49	16 - 49							138 - 255	.0001-.0008	.0008-.0020 .0016-.0039	98 - 262	3.1
	7 - 33	7 - 33							115 - 213	.0001-.0008	.0008-.0016 .0012-.0031	98 - 197	4.1
								230 - 426	367 - 682		.0016-.0028 .0020-.0059	328 - 656	1.1
								230 - 426	367 - 682		.0016-.0028 .0020-.0059	328 - 656	1.2
								207 - 384	344 - 640		.0016-.0028 .0020-.0059	262 - 656	2.1
								207 - 384	344 - 640		.0016-.0028 .0020-.0059	262 - 656	2.2
								207 - 384	344 - 640		.0016-.0028 .0020-.0059	262 - 656	3.1
								207 - 384	344 - 640		.0016-.0028 .0020-.0059	262 - 656	3.2
								207 - 384	344 - 640		.0016-.0028 .0020-.0059	262 - 656	4.1
								207 - 384	344 - 640		.0016-.0028 .0020-.0059	262 - 656	4.2
				49 - 131				413 - 768	642 - 1194	.0004-.0020	.0020-.0031 .0028-.0079	492 - 1312	1.1
				49 - 131				413 - 768	642 - 1194	.0004-.0020	.0020-.0031 .0028-.0079	492 - 1312	1.2
				49 - 131				413 - 768	642 - 1194	.0004-.0020	.0020-.0031 .0028-.0079	492 - 1312	1.3
				49 - 131				413 - 768	642 - 1194	.0004-.0020	.0020-.0031 .0028-.0079	492 - 1312	1.4
					66 - 197	66 - 197	66 - 197	413 - 768	642 - 1194	.0004-.0020	.0020-.0031 .0028-.0079	492 - 1312	1.5
					66 - 197	66 - 197	66 - 197		344 - 640	.0004-.0020	.0020-.0031 .0028-.0079	328 - 656	1.6
				16 - 98				413 - 768	642 - 1194	.0003-.0020	.0020-.0031 .0028-.0079	492 - 1312	2.1
					33 - 131	33 - 131	33 - 131	413 - 768	642 - 1194	.0003-.0020	.0020-.0031 .0028-.0079	492 - 1312	2.2
								413 - 768	642 - 1194	.0003-.0020	.0020-.0031 .0028-.0079	492 - 1312	2.3
	16 - 82	16 - 82						253 - 469	413 - 768	.0003-.0016	.0016-.0028 .0020-.0059	328 - 820	2.4
	16 - 82	16 - 82						253 - 469	413 - 768	.0003-.0016	.0016-.0028 .0020-.0059	328 - 820	2.5
								344 - 640	413 - 768	.0003-.0016	.0016-.0028 .0020-.0059	328 - 820	2.6
	7 - 33	7 - 33							138 - 256	.0001-.0008	.0008-.0020 .0016-.0059	131 - 262	2.7
									115 - 213	.0001-.0008	.0008-.0020 .0016-.0059	98 - 197	2.8
								413 - 768	642 - 1194	.0004-.0020	.0020-.0031 .0028-.0079	492 - 1312	3.1
								413 - 768	642 - 1194	.0004-.0020	.0020-.0031 .0028-.0079	492 - 1312	3.2
								253 - 468	642 - 1194	.0004-.0020	.0020-.0039 .0031-.0098	328 - 1312	4.1
								253 - 468	642 - 1194	.0004-.0020	.0020-.0039 .0031-.0098	328 - 1312	4.2
									344 - 640	.0004-.0020	.0020-.0039 .0031-.0098	262 - 394	4.3
									344 - 640	.0004-.0020	.0020-.0039 .0031-.0098	262 - 394	4.4
								230 - 426	344 - 640		.0016-.0028 .0031-.0098	328 - 656	5.1
								69 - 128	115 - 213		.0008-.0016 .0012-.0031	98 - 197	5.2
									344 - 640				5.3
	16 - 49	16 - 49						92 - 171	138 - 256	.0001-.0012	.0012-.0021 .0016-.0039	98 - 262	1.1
	7 - 33	7 - 33						92 - 171	138 - 256	.0001-.0012	.0012-.0021 .0016-.0039	98 - 262	1.2
	3 - 26	3 - 26						69 - 128	115 - 213	.0001-.0008	.0008-.0016 .0012-.0031	98 - 197	1.3
	7 - 33	7 - 33							105 - 194	.0001-.0008	.0008-.0016 .0012-.0031	98 - 197	2.1
	7 - 33	7 - 33							105 - 194	.0001-.0008	.0008-.0016 .0012-.0031	98 - 197	2.2
									69 - 128	.0001-.0008	.0008-.0016 .0012-.0031	98 - 131	2.3
	7 - 33	7 - 33							105 - 194	.0001-.0008	.0008-.0016 .0012-.0031	98 - 197	2.4
									69 - 128	.0001-.0008	.0008-.0016 .0012-.0031	98 - 131	2.5
									69 - 128	.0001-.0008	.0008-.0016 .0012-.0031	98 - 131	2.6
									105 - 194		.0006-.0016 .0012-.0031	98 - 197	1.1
									105 - 194		.0006-.0016 .0012-.0031	98 - 197	1.2
													1.3
													1.4
													1.5

P M K N S H

Cutting speed v_c in SFM

Feed per tooth fz in mm

NEW ZGF-S-CUT SELF LOCKING THREAD MILLS

EMUGE's NEW advanced ZGF-S-Cut Solid Carbide Thread Mills with helical flutes, multiple teeth and TIALN-T46 coating **increase tool life more than 10X** and produce perfect threads in exotic materials.

The EMUGE ZGF-S-CUT line of premium sub-micro grain carbide thread mills is ideal in demanding materials and industries such as aerospace where nickel alloys, titanium and stainless steel are the norm. A unique design enables three tooth pitches to simultaneously rough and finish-cut threads, dramatically increasing tool life and reducing cycle times.

NEW ZGF-S-CUT THREAD MILLS

Bottoming Style • 2XD

- Left-hand helix flute design with left-hand spindle rotation greatly enhances stability and performance
- First tooth acts as a rougher, while the second and third teeth finish full thread profile
- 10X higher tool life and cycle time reductions than conventional tools!
- TIALN-T46 coating resists heat and wear, extending tool life
- **Axial coolant tools starting at 1/4" size***

	NEW
	LK ZGF-S-CUT
Coating	TIALN-T46
Type	Bottoming
Materials / Cutting Data (See pages 6-7)	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

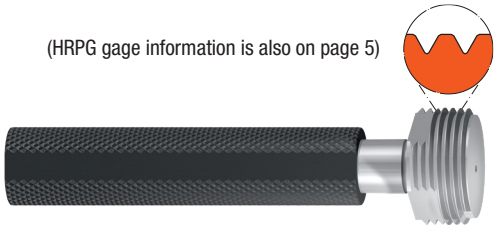
Size	Thread	OAL	Cutting Dia.	Shank Dia. (mm)	Shank Style	# Flutes	EDP No.
2-56	UNC	1.535	0.067	3	HA	4	**GF26A729.5654**
4-40		1.535	0.085	3	HA	4	**GF26A729.5656**
6-32		1.535	0.106	3	HA	4	**GF26A729.5658**
8-32		1.657	0.132	4	HA	4	**GF26A729.5659**
10-24		1.653	0.146	4	HA	4	**GF26A729.5660**
1/4-20*		2.165	0.195	6	HA	4	**GF26A729.5662**
5/16-18*		2.283	0.248	8	HA	5	**GF26A729.5663**
3/8-16*		2.440	0.303	8	HA	5	**GF26A729.5664**
7/16-14*		2.913	0.354	10	HA	5	**GF26A729.5665**
1/2-13*		3.150	0.410	12	HA	5	**GF26A729.5666**
10-32	UNF	1.653	0.154	4	HA	5	**GF26A729.5711**
1/4-28*		2.165	0.207	6	HA	6	**GF26A729.5713**
5/16-24*		2.283	0.260	8	HA	6	**GF26A729.5714**
3/8-24*		2.283	0.260	10	HA	7	**GF26A729.5715**
7/16-20*		2.913	0.376	10	HA	7	**GF26A729.5716**
1/2-20*		2.913	0.376	12	HA	9	**GF26A729.5717**

* Axial coolant tools

NEW LK-UNC and LK-UNF BT PLUG HRPG** THREAD GAGE - NO-GO

Specifically designed for Self-Lock thread profile

(HRPG gage information is also on page 5)



When gaging a Self-Lock thread form produced by thread milling, it is recommended that an additional inspection gage be used – an HRPG plug gage.

The HRPG gage is used to check the lower ramp point for possible ramp angle errors and should be used along with a standard Self-Lock thread plug gage to verify all thread profile features.

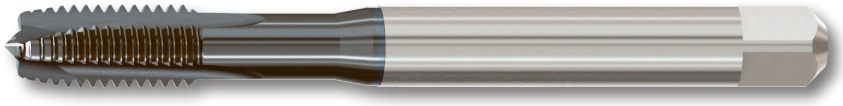
Size	Thread	Pitch	EDP No.
6	UNC	32	**L1140100.5658**
8		32	**L1140100.5659**
10		24	**L1140100.5660**
1/4		20	**L1140100.5662**
5/16		18	**L1140100.5663**
3/8		16	**L1140100.5664**
7/16		14	**L1140100.5665**
1/2		13	**L1140100.5666**

Size	Thread	Pitch	EDP No.
10	UNF	32	**L1140100.5711**
1/4		28	**L1140100.5713**
5/16		24	**L1140100.5714**
3/8		24	**L1140100.5715**
7/16		20	**L1140100.5716**
1/2		20	**L1140100.5717**

** High Ramp Precision Gage

LK-UNC / LK-UNF TAPS

Plug Style
DIN / ANSI



- Rekord 1B-Z PM GLT-1 is a powdered metal HSSE tap with GLT-1 coating for a wide range of applications.
- Rekord C-TI TICN is a HSSE tap designed specifically for titanium and aerospace alloys.

	Rekord B-STEEL	Rekord B-Z PM GLT-1	Rekord C-TI TICN
Coating	Bright	GLT-1	TICN
Type	Plug	Plug	Plug
Chamfer	B / 4-5 P	B / 4-5 P	C / 2-3 P
Materials / Cutting Data (See pages 6-7)	P 2.1-3.1 N 2.2-2.5	P 1.1-4.1 M 1.1-41 N 1.4-6,2.2	P 4.1-5.1 M 3.1-4.1 N 2.4-5, 2.7 S 1.1-2.2, 2.4

Size	Thread	OAL	Shank	Square	EDP No.	EDP No.	EDP No.
4-40	UNC	2.205	0.141	0.110		**BU20A600.5656**	**BU309600.5656**
6-32		2.205	0.141	0.110		**BU20A600.5658**	**BU309600.5658**
8-32		2.480	0.168	0.131		**BU20A600.5659**	**BU309600.5659**
10-24		2.756	0.194	0.152		**BU20A600.5660**	**BU309600.5660**
12-24		3.150	0.220	0.165		**BU20A600.5661**	**BU309600.5661**
1/4-20		3.150	0.255	0.191	**BU208900.5662**	**BU20A600.5662**	**BU309600.5662**
5/16-18		3.543	0.318	0.238	**BU208900.5663**	**BU20A600.5663**	**BU309600.5663**
3/8-16		3.937	0.381	0.286	**BU208900.5664**	**BU20A600.5664**	**BU309600.5664**
7/16-14		3.937	0.323	0.242		**CU20A600.5665**	**CU309600.5665**
1/2-13		4.331	0.367	0.275	**CU208900.5666**	**CU20A600.5666**	**CU309600.5666**
9/16-12		4.331	0.429	0.322		**CU20A600.5667**	
5/8-11		4.331	0.480	0.360		**CU20A600.5668**	
3/4-10		4.921	0.590	0.442		**CU20A600.5669**	
7/8-9		5.512	0.697	0.523		**CU20A600.5670**	
1-8		6.299	0.800	0.600		**CU20A600.5671**	
4-48	UNF	2.205	0.141	0.110		**BU20A600.5707**	
6-40		2.205	0.141	0.110		**BU20A600.5709**	
8-36		2.480	0.168	0.131		**BU20A600.5710**	
10-32		2.756	0.194	0.152		**BU20A600.5711**	
1/4-28		3.150	0.255	0.191		**BU20A600.5713**	
5/16-24		3.543	0.318	0.238		**BU20A600.5714**	
3/8-24		3.937	0.381	0.286		**BU20A600.5715**	
7/16-20		3.937	0.323	0.242		**CU20A600.5716**	
1/2-20		3.937	0.367	0.275		**CU20A600.5717**	
9/16-18		3.937	0.429	0.322		**CU20A600.5718**	
5/8-18		3.937	0.480	0.360		**CU20A600.5719**	
3/4-16		4.331	0.590	0.442		**CU20A600.5720**	

LK-UNC THREAD GAGE - GO / NO-GO

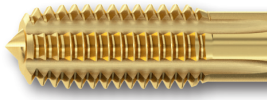
Specifically designed for
Self-Lock thread profile

Size	Pitch	EDP No.
2	56	**L0100100.5654**
4	40	**L0100100.5656**
6	32	**L0100100.5658**
8	32	**L0100100.5659**
10	24	**L0100100.5660**
12	24	**L0100100.5661**
1/4	20	**L0100100.5662**
5/16	18	**L0100100.5663**

Size	Pitch	EDP No.
3/8	16	**L0100100.5664**
7/16	14	**L0100100.5665**
1/2	13	**L0100100.5666**
9/16	12	**L0100100.5667**
5/8	11	**L0100100.5668**
3/4	10	**L0100100.5669**
7/8	9	**L0100100.5670**
1	8	**L0100100.5671**

LK-UNC / LK-UNF TAPS

Bottoming and
Semi-Bottoming Style
DIN / ANSI



Form Tap

- Enorm Z/E GLT-1 is a full bottoming HSSE tap with GLT-1 coating for a wide range of applications.
- Rekord D-TI TICN is a HSSE tap designed specifically for titanium and aerospace alloys.
- Drück Steel / E is a roll form tap for chipless tapping of low tensile materials

	Enorm Z/E	Enorm Z/E GLT-1	Rekord D-TI TICN	Form Tap: Drück Steel / E -SN TIN T1
Coating	Bright	GLT-1	TICN	TIN-T1
Type	Bottoming	Bottoming	Semi-Bottoming	Bottoming
Chamfer	E / 1.5-2 P	E / 1.5-2 P	C / 2-3 P	E / 1.5-2 P
Materials / Cutting Data (See pages 6-7)	P 1.1-3.1	N 1.1-4 N 2.1	P 4.1-5.1 M 3.1-4.1 N 2.4-5, 2.7 S 1.1-2.2, 2.4	P 1.1-3.1 N 1.4-5,2.2

Size	Thread	OAL	Shank	Square	EDP No.	EDP No.	EDP No.	EDP No.
4-40	UNC	2.205	0.141	0.110		**BU51C400.5656**	**BU459600.5656**	**BU93F300.5656**
6-32		2.205	0.141	0.110		**BU51C400.5658**	**BU459600.5658**	**BU93F300.5658**
8-32		2.480	0.168	0.131		**BU51C400.5659**	**BU459600.5659**	**BU93F300.5659**
10-24		2.756	0.194	0.152		**BU51C400.5660**	**BU459600.5660**	**BU93F300.5660**
12-24		3.150	0.220	0.165		**BU51C400.5661**	**BU459600.5661**	**BU93F300.5661**
1/4-20		3.150	0.255	0.191	**BU513500.5662**	**BU51C400.5662**	**BU459600.5662**	**BU93F300.5662**
5/16-18		3.543	0.318	0.238	**BU513500.5663**	**BU51C400.5663**	**BU459600.5663**	**BU93F300.5663**
3/8-16		3.937	0.381	0.286	**BU513500.5664**	**BU51C400.5664**	**BU459600.5664**	**BU93F300.5664**
7/16-14		3.937	0.323	0.242		**CU51C400.5665**	**CU459600.5665**	**CU93F300.5665**
1/2-13		4.331	0.367	0.275	**CU513500.5666**	**CU51C400.5666**	**CU459600.5666**	**CU93F300.5666**
9/16-12		4.331	0.429	0.322		**CU51C400.5667**		
5/8-11		4.331	0.480	0.360		**CU51C400.5668**		
3/4-10		4.921	0.590	0.442		**CU51C400.5669**		
7/8-9		5.512	0.697	0.523		**CU51C400.5670**		
1-8		6.299	0.800	0.600		**CU51C400.5671**		
4-48	UNF	2.205	0.141	0.110		**BU51C400.5707**		**BU93F300.5707**
6-40		2.205	0.141	0.110		**BU51C400.5709**		**BU93F300.5709**
8-36		2.480	0.168	0.131		**BU51C400.5710**		**BU93F300.5710**
10-32		2.756	0.194	0.152		**BU51C400.5711**		**BU93F300.5711**
1/4-28		3.150	0.255	0.191		**BU51C400.5713**		**BU93F300.5713**
5/16-24		3.543	0.318	0.238		**BU51C400.5714**		**BU93F300.5714**
3/8-24		3.937	0.381	0.286		**BU51C400.5715**		**BU93F300.5715**
7/16-20		3.937	0.323	0.242		**CU51C400.5716**		**CU93F300.5716**
1/2-20		4.331	0.367	0.275		**CU51C400.5717**		**CU93F300.5717**
9/16-18		4.331	0.429	0.322		**CU51C400.5718**		
5/8-18		4.331	0.480	0.360		**CU51C400.5719**		
3/4-16		4.921	0.590	0.442		**CU51C400.5720**		

LK-UNF THREAD GAGE - GO / NO-GO

Specifically designed for
Self-Lock thread profile

Size	Pitch	EDP No.
4	48	**L0100100.5707**
6	40	**L0100100.5709**
8	36	**L0100100.5710**
10	32	**L0100100.5711**
1/4	28	**L0100100.5713**
5/16	24	**L0100100.5714**

Size	Pitch	EDP No.
3/8	24	**L0100100.5715**
7/16	20	**L0100100.5716**
1/2	20	**L0100100.5717**
9/16	18	**L0100100.5718**
5/8	18	**L0100100.5719**
3/4	16	**L0100100.5720**

LK-M METRIC TAPS

Plug and Semi-Bottoming Style • DIN / DIN

	Rekord A-GG NT	Rekord B-VA NT	Rekord B-VA TIN
Coating	NT	NT	TIN
Type	Semi-Bottoming	Plug	Plug
Chamfer	C / 2-3 P	B / 4-5 P	B / 4-5 P
Materials / Cutting Data (See pages 6-7)	K 1.1-2	P 2.1-3.1 N 2.2,2-5	P 1.1-4.1

Size	Pitch	OAL	Shank	Square	EDP No.	EDP No.	EDP No.
M6	1.00	80.0	6.0	4.9	B0102000.1052	B0203000.1052	B0203100.1052
M8	1.25	90.0	8.0	6.2	B0102000.1054	B0203000.1054	B0203100.1054
M10	1.50	100.0	10.0	8.0	B0102000.1056	B0203000.1056	B0203100.1056
M12	1.75	110.0	9.0	7.0	C0102000.1058	C0203000.1058	C0203100.1058
M16	2.00	110.0	12.0	9.0	C0102000.1060	C0203000.1060	C0203100.1060
M20	2.50	140.0	16.0	12.0	C0102000.1062		
M24	3.00	160.0	18.0	14.5	C0102000.1064		

LK-M METRIC FORM TAPS

Semi-Bottoming Style • DIN / DIN

	Drück Steel TIN	Drück Steel-SN TIN
Coating	TIN	TIN
Type	Semi-Bottoming	Semi-Bottoming
Chamfer	C / 2-3 P	C / 2-3 P
Materials / Cutting Data (See pages 6-7)	P 1.1-3.1 N 1.5-6, 2..2	

Size	Pitch	OAL	Shank	Square	EDP No.	EDP No.
M3	0.50	56.0	3.5	2.7	B0911400.1046	B0921400.1046
M4	0.70	63.0	4.5	3.4	B0911400.1048	B0921400.1048
M5	0.80	70.0	6.0	4.9	B0911400.1050	B0921400.1050
M6	1.00	80.0	6.0	4.9	B0911400.1052	B0921400.1052
M8	1.25	90.0	8.0	6.2	B0911400.1054	B0921400.1054
M10	1.50	100.0	10.0	8.0	B0911400.1056	B0921400.1056

LK-M METRIC TAPS

Bottoming Style • DIN / DIN

	Enorm Z/E
Coating	Bright
Type	Bottoming
Chamfer	E / 1.5-2 P
Materials / Cutting Data (See pages 6-7)	P 1.1-3.1

Size	Pitch	OAL	Shank	Square	EDP No.
M3	0.50	56.0	3.5	2.7	B0513500.1046
M4	0.70	63.0	4.5	3.4	B0513500.1048
M5	0.80	70.0	6.0	4.9	B0513500.1050
M6	1.00	80.0	6.0	4.9	B0513500.1052
M8	1.25	90.0	8.0	6.2	B0513500.1054
M10	1.50	100.0	10.0	8.0	B0513500.1056
M12	1.75	110.0	9.0	7.0	C0513500.1058
M16	2.00	110.0	12.0	9.0	C0513500.1060

LK-M THREAD GAGE GO / NO-GO

Specifically designed for Self-Lock thread profile.
For Metric Taps and Thread Mills.

Size	Pitch	EDP No.
M3	0.50	L0100100.1046
M4	0.70	L0100100.1048
M5	0.80	L0100100.1050
M6	1.00	L0100100.1052
M8	1.25	L0100100.1054
M10	1.50	L0100100.1056
M12	1.75	L0100100.1058
M14	2.00	L0100100.1059
M16	2.00	L0100100.1060
M20	2.50	L0100100.1062
M24	3.00	L0100100.1064

LK-M METRIC THREAD MILLS with Countersink

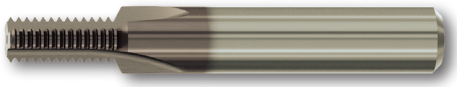
Coolant Fed • 2XD

	GSF-2XD IKZ-HB	GSF-2XD IKZ-HE	GSF-2XD IKZ-HA
Shank	HB	HE	HA
Materials / Cutting Data (See pages 6-7)	P 1.1-5.1, K 1.1-4.2, N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.1-2, S 1.1-3		

Size	Pitch	Cutter Dia.	LOC	OAL	Shank Dia.	# Flutes	EDP No.	EDP No.	EDP No.
M5	0.80	4.0	10.7	55.0	6.0	3	GF333101.1050	GF333401.1050	GF333701.1050
M6	1.00	4.8	12.4	62.0	8.0	3	GF333101.1052	GF333401.1052	GF333701.1052
M8	1.25	6.5	16.7	74.0	10.0	3	GF333101.1054	GF333401.1054	GF333701.1054
M10	1.50	8.2	20.1	80.0	12.0	3	GF333101.1056	GF333401.1056	GF333701.1056
M12	1.75	9.9	25.2	90.0	14.0	4	GF333101.1058	GF333401.1058	GF333701.1058

LK-M METRIC THREAD MILLS with Countersink

Coolant Fed • 2XD • TICN coating



	GSF-2XD IKZ-HB TiCN	GSF-2XD IKZ-HE TiCN	GSF-2XD IKZ-HA TiCN
Shank	HB	HE	HA
Materials / Cutting Data (See pages 6-7)	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		

Size	Pitch	Cutter Dia.	LOC	OAL	Shank Dia.	# Flutes	EDP No.	EDP No.	EDP No.
M5	0.80	4.0	10.7	55.0	6.0	3	GF333106.1050	GF333406.1050	GF333706.1050
M6	1.00	4.8	12.4	62.0	8.0	3	GF333106.1052	GF333406.1052	GF333706.1052
M8	1.25	6.5	16.7	74.0	10.0	3	GF333106.1054	GF333406.1054	GF333706.1054
M10	1.50	8.2	20.1	80.0	12.0	3	GF333106.1056	GF333406.1056	GF333706.1056
M12	1.75	9.9	25.2	90.0	14.0	4	GF333106.1058	GF333406.1058	GF333706.1058

LK-M METRIC THREAD MILLS

Coolant Fed

	GF-IKZ HB	GF-IKZ HE	GF-IKZ HA
Shank	HB	HE	HA
Materials / Cutting Data (See pages 6-7)	P 1.1-5.1, K 1.1-4.2, N 1.1-5, 2.1-6, 3.1-2, 4.1-2, 5.1-2, S 1.1-3		

Pitch	Dia. (min)	Cutter Dia.	LOC	OAL	Shank Dia.	# Flutes	EDP No.	EDP No.	EDP No.
1.00	14.00	9.9	16.4	70.0	10.0	4	GF163211.9757	GF163511.9757	GF163811.9757
1.00	16.00	11.9	20.4	80.0	12.0	4	GF163121.9757	GF163421.9757	GF163721.9757
1.50	14.00	9.9	17.0	70.0	10.0	4	GF163211.9664	GF163511.9664	GF163811.9664
1.50	16.00	11.9	21.5	80.0	12.0	4	GF163121.9664	GF163421.9664	GF163721.9664
2.00	22.00	15.9	26.7	90.0	16.0	5	GF163131.9705	GF163431.9705	GF163731.9705
3.00	30.00	19.9	34.1	105.0	20.0	5	GF163151.9767	GF163451.9767	GF163751.9767

LK-M METRIC THREAD MILLS

Coolant Fed • TICN coating

	GF-IKZ HB TiCN	GF-IKZ HE TiCN	GF-IKZ HA TiCN
Shank	HB	HE	HA
Materials / Cutting Data (See pages 6-7)	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		

Pitch	Dia. (min)	Cutter Dia.	LOC	OAL	Shank Dia.	# Flutes	EDP No.	EDP No.	EDP No.
1.00	14.00	9.9	16.4	70.0	10.0	4	GF163216.9757	GF163516.9757	GF163816.9757
1.00	16.00	11.9	20.4	80.0	12.0	4	GF163126.9757	GF163426.9757	GF163726.9757
1.50	14.00	9.9	17.0	70.0	10.0	4	GF163216.9664	GF163516.9664	GF163816.9664
1.50	16.00	11.9	21.5	80.0	12.0	4	GF163126.9664	GF163426.9664	GF163726.9664
2.00	22.00	15.9	26.7	90.0	16.0	5	GF163136.9705	GF163436.9705	GF163736.9705
3.00	30.00	19.9	34.1	105.0	20.0	5	GF163156.9767	GF163456.9767	GF163756.9767

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