JSK PRECISION TOOLS LTD

THREADING TOOLS

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Performance

Premium quality tools for high performance.

The premium quality tools from the JSK product line have been designed for specific applications and are distinguished by their outstanding performance. If you make high demands on the performance of your production and want to achieve the very best results, we recommend the Premium tools in this product line.

Symbol explanation

Chamfer form

B 4–5	Form B (with spiral point, 4 – 5 cutting leads)
C 2–3	Form C (without spiral point, 2 – 3 cutting leads)
D 4–5	Form D (without spiral point, 4 – 5 cutting leads)
E 1,5–2	Form E (without spiral point, 1.5 – 2 cutting leads)

Helix angle

42°	Example: helix angle 42°

Tolerances

ISO 2 6H	

Tensile strength

≤ 1100 N/mm²	Example up to 1100 N/mm²

Tap Material

HSS	High-speed steel
HSS-E	High-performance high speed steel
HSS-PM	High-performance sintered high-speed steel
VHM	Solid carbide

Coloured rings

Thread types

M	

Version

	Int. coolant supply

Tap types

Tool type

for through holes to 4xD

for blind holes up to 3xD, high helix angle for secure chip evacuation

straight flutes for through and blind holes up 2xD

left hand helix for through holes up to 4xD

for blind holes up to 2xD, 15°, 25° or 30° helix angle

thread former for through and blind holes up to 3xD

Application range

for universal application

for good quality free machining steel

for tempered and heat-resistant steels < 1100 N/mm²

for high-tensile steels < 1400 N/mm²

for cast iron

for stainless and acid-resistant steels up to 1100 N/mm²

for aluminium

for soft materials

for short chipping brass

for titanium and titanium alloys

special for Inconel 718

for Ampco alloys

for hardened steel and chilled iron up to 55 HRc

Spanlos – thread former for universal application

Spanlos – thread former for heat resistant alloys

hand taps for stainless, heat-resistant and heat-treated steels up to 1100 N/mm²

hand tap for steel up to 1400 N/mm², wolfram, chilled iron

dies for steel

for universal application up to 1000 N/mm²

for steel to 850 N/mm²

for high-tensile steel to 1100 N/mm ²

for corrosion and acid-resistant steels

for cast iron

for aluminium and aluminium alloys

Special Features

for synchronised CNC machining with minimum length compensation chuck

for synchronised CNC machining with minimum length compensation chuck

with Weldon flat for synchronised CNC machining without length compensation chuck

with intermittent teeth, reduces friction

with back taper, for deep threads

for dry machining or minimum quantity lubrication (MMS)

for high-speed machining, up to 100 m/min.

for left hand threads

extra long, with double overall length

short version for automatic use

thread formers with lubrication grooves

extra short

machine taps

lapped dies

Thread types

ISO metric coarse thread DIN 13

Unified fine thread ASME – B1.1

American taper pipe thread with sealing (1:16) ANSI/ASME – B1.20.3

ISO Metric coarse thread for wire inserts DIN 8140-2

EG Unified fine thread for wire inserts ASME – B18.29.1

Cyl. Whitworth coarse thread DIN EN 10226-1 (ISO7-1)

ISO Metric fine thread DIN 13

Unified coarse thread ASME – B1.15 and ISO 3161

Whitworth taper pipe thread (1:16) DIN EN 10226-2 (ISO7-1)

Whitworth pipe thread DIN EN ISO 228

Unified fine thread ASME – B1.15 and ISO 3161

ISO metric trapezoidal thread DIN 103

Unified coarse thread ASME – B1.1

Whitworth thread BS84

The thread types BSW, NPTF, Rp and Rc as well as hand taps and dies are now available in the online shop.

EG Unified coarse thread for wire inserts ASME – B18.29.1

American taper pipe thread with sealing (1:16) ANSI/ASME – B1.20.1

Toolfinder

Thread formers

for cold-formable materials

HSS taps


Through hole – Blind hole

for universal application up to 1100 N/mm²


Through hole


Blind hole

for steel up to 750 N/mm²


Through hole


Blind hole


Through hole – Blind hole

for steel up to 1400 N/mm²


Through hole


Blind hole


Through hole – Blind hole

for corrosion and acid-resistant steels


Through hole


Blind hole

for cast iron materials


Through hole – Blind hole

for heat-resistant materials


Through hole


Blind hole


Through hole – Blind hole

for aluminium and non-ferrous metal


Through hole


Blind hole

Hard materials


Through hole – Blind hole

Taps Overview

M – Metric ISO Standard

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Universal				**UNI**	ISO 2 6H ISO 3 6G 7G	HSS-E	■		
				**UNI**	ISO 2 6H	HSS-E HSS-PM	■		
				**UNI NCW**	ISO 2 6H	HSS-PM	■		with Weldon flat for synchronised CNC machining without length compensation chuck
				**UNI NCW**	ISO 2 6H	HSS-PM	■		with Weldon flat for synchronised CNC machining without length compensation chuck
				**UNI DRY**	ISO 2X 6HX	HSS-E	■		for dry machining or minimum quantity lubrication (MMS)
				**UNI CNC**	ISO 2X 6HX ISO 3X 6GX 7GX	HSS-E	■		for synchronised CNC machining with minimum length compensation chuck
				**UNI NC**	ISO 2 6H	HSS-E	■		for synchronised CNC machining with minimum length compensation chuck
				**UNI EL**	ISO 2 6H	HSS-E	■		extra long, with double overall length
Steel				**ST**	ISO 2 6H	HSS-E		□	
				**ST**	ISO 1 4H ISO 3 6G	HSS-E		□	
				**FE**	ISO 2 6H	HSS-E		□	
				**FE ES**	ISO 2 6H	HSS-E		□	extra short
				**ST AZ**	ISO 2 6H	HSS-E		□	with intermittent teeth, reduces friction
				**ST LH**	ISO 2 6H	HSS-E		□	for left hand threads
				**ST TS**	ISO 2X 6HX	HSS-E	■		for high-speed machining, up to 100 m/min.
				**HR**	ISO 2X 6HX	HSS-PM	■		
				**VG**	ISO 2X 6HX	HSS-E	■		
				**FE-HF**	ISO 2 6H	HSS-E	■		
				**VG AZ**	ISO 2 6H	HSS-E	■		with intermittent teeth, reduces friction

Taps Overview

M – Metric ISO Standard

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Steel	✓			**ST EL**	ISO 2 6H	HSS-E		□	extra long, with double overall length
	✓			**ST MMB**	ISO 2 6H	HSS-E		□	Machine taps
Stainless steel	✓			**VA**	ISO 2 6H	HSS-E	■		
	✓			**VA**	ISO 2 6H	HSS-PM HSS-E	■	□	
Non-ferrous metals	✓			**NW**	ISO 2 6H	HSS-E	■		
	✓			**AL**	ISO 2 6H	HSS-E	■	□	
	✓			**Soft**	ISO 2 6H	HSS-E	■		
Heat-resistant	✓			**Ti**	ISO 1X 4HX ISO 2X 6HX	HSS-PM	■		
	✓			**Ti**	ISO 2X 6HX	HSS-E	■		
	✓			**Ni**	ISO 2X 6HX	HSS-E	■		
Universal		✓		**UNI**	ISO 2 6H 7G	HSS-E	■		with thro' coolant
		✓		**UNI**	ISO 1 4H ISO 3 6G	HSS-E	■		
		✓		**UNI**	ISO 2 6H	HSS-E HSS-PM	■		
		✓		**UNI NCW**	ISO 2 6H	HSS-PM	■		with Weldon flat for synchronised CNC machining without length compensation chuck
		✓		**UNI NCW**	ISO 2 6H	HSS-PM	■		with Weldon flat for synchronised CNC machining without length compensation chuck
		✓		**UNI CNC**	ISO 2X 6HX ISO 2 6H	HSS-E	■		for synchronised CNC machining with minimum length compensation chuck, with thro' coolant
		✓		**UNI CNC**	ISO 3 6G, 7G	HSS-E	■		for synchronised CNC machining with minimum length compensation chuck
		✓		**UNI NC**	ISO 2 6H	HSS-E	■		for synchronised CNC machining with minimum length compensation chuck
		✓		**UNI DRY**	ISO 2 6H	HSS-E	■		for dry machining or minimum quantity lubrication (MMS), with thro' coolant

Taps Overview

M – Metric ISO Standard

Application range	Through hole	Blind hole	Through hole-Blind hole		Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Universal					**UNI S**	ISO 2 6H	HSS-E	■		with back taper, for deep threads
					UNI ES	ISO 2 6H	HSS-E	■		extra short
					UNI EL	ISO 2 6H	HSS-E	■		extra long, with double overall length
					UNI	ISO 2 6H	HSS-E		□	
Steel					**ST**	ISO 2 6H	HSS-E		□	
					ST CNC	ISO 2X 6HX	HSS-E	■		for synchronised CNC machining with minimum length compensation chuck, with thro' coolant
					ST TS	ISO 2 6H	HSS-PM	■		for high-speed machining, up to 100 m/min.
					ST TS	ISO 2X 6HX	HSS-E	■		for high-speed machining, up to 100 m/min.
					ST ES	ISO 2 6H	HSS-E		□	extra short
					ST AUT/ES	ISO 2 6H	HSS-E		□	short version for automatic use; extra short
					ST EL	ISO 2 6H	HSS-E		□	extra long, with double overall length
					HR	ISO 2 6H	HSS-PM		□	
					ST	ISO 2 6H	HSS-E	■	□	
					ST	ISO 1 4H ISO 3 6G	HSS-E	■	□	
					FE	ISO 2 6H	HSS-E		□	
					FE-HF	ISO 2 6H	HSS-E	■		
					ST LH	ISO 2 6H	HSS-E		□	for left hand threads
					ST ES	ISO 2 6H	HSS-E		□	extra short
					ST EL	ISO 2 6H	HSS-E		□	extra long, with double overall length

Taps Overview

M – Metric ISO Standard

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Steel				**HR**	ISO 2 6H	HSS-PM	■	□	
				**ST TS**	ISO 2 6H	HSS-E	■		with thro‘ coolant
Stainless steel				**VA**	ISO 2 6H	HSS-E	■		with thro‘ coolant
				**VA**	ISO 2 6H	HSS-E HSS-PM	■	□	
				**VA S**	ISO 2 6H	HSS-E	■		with back taper, for deep threads
Non-ferrous metals				**Soft**	ISO 2 6H	HSS-E	■	□	
				**NW**	ISO 2 6H	HSS-E	■		
				**AL**	ISO 2 6H	HSS-E	■	□	
Heat-resistant				**Ti**	ISO 2X	HSS-PM	■		
				**Ni**	ISO 2X ISO 2 6H	HSS-PM	■		
Steel				**ST**	ISO 2X 6HX	HSS-E		□	
				**ST AZ**	ISO 2X 6HX	HSS-E		□	with intermittent teeth, reduces friction
				**ST ES**	ISO 2X 6HX	HSS-E		□	extra short
				**ST LH/ES**	ISO 2X 6HX	HSS-E		□	for left hand threads; extra short
				**HR**	ISO 2X 6HX	HSS-E	■		
				**HR EL**	ISO 2X 6HX	HSS-E	■		extra long, with double overall length
Cast iron				**GG**	ISO 2X 6HX	HSS-E	■		with thro‘ coolant
				**GG**	ISO 2X 6HX	HSS-E	■		
Non-ferrous metals				**Ms**	ISO 2X 6HX	HSS-E		□	

Taps Overview

M – Metric ISO Standard

Application range	Through hole	Blind hole	Through hole-Blind hole		Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Heat-resistant					**AMPCO**	ISO 2X 6HX	HSS-PM		□	
Tempered steel					**HT**	ISO 2X 6HX	VHM HSS-PM	■		
Machine thread formers					**EC**	ISO 2X 6HX	HSS-E HSS-PM	■		
					**EC SN**	ISO 2X 6HX ISO 3X 6GX	HSS-E HSS-PM	■		Thread formers with oil grooves and thro' coolant
					**NEO SN**	ISO 2X 6HX	HSS-PM	■		Thread formers with oil grooves and thro' coolant
					**UNI**	ISO 2X 6HX	HSS-E	■		
					**UNI SN**	ISO 2X 6HX	HSS-E	■		Thread formers with lubrication grooves
Hand taps					**ST**	ISO 2X 6HX	HSS-E VHM		□	
					ERGO	ISO 2X 6HX	HSS-E		□	
					ERGO F.T.	ISO 2X 6HX	HSS-E	■		
Dies					**FE**	ISO 6g ISO 6e	HSS		□	
					FE	ISO 6g	HSS		□	
					FE R_z=1	ISO 6g	HSS		□	Lapped Dies
					FE LH	ISO 6g	HSS		□	for left hand threads
					VA	ISO 6g	HSS-E		□	
					VA R_z=1	ISO 6g	HSS-E		□	Lapped Dies
					Ms R_z=1	ISO 6g	HSS		□	Lapped Dies

Taps Overview

Metric ISO standard thread for wire thread inserts

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Universal				**UNI**	6H mod	HSS-E	■		
Universal				**UNI**	6H mod	HSS-E	■		
Non-ferrous metals				**Soft**	6H mod	HSS-E	■		

MF – Metric ISO Fine Thread

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Universal				**UNI**	ISO 2 6H	HSS-E	■		
Universal				**UNI**	ISO 3 6G	HSS-E	■		
Universal				**UNI**	ISO 2 6H	HSS-PM HSS-E	■		
Universal				**UNI DRY**	ISO 2X 6HX	HSS-E	■		for dry machining or minimum quantity lubrication (MMS)
Steel				**ST**	ISO 2 6H	HSS-E		□	
Steel				**FE**	ISO 2 6H	HSS-E		□	
Steel				**FE-HF**	ISO 2 6H	HSS-E	■		
Steel				**ST TS**	ISO 2X 6HX	HSS-E	■		for high-speed machining, up to 100 m/min.
Steel				**ST LH**	ISO 2 6H	HSS-E		□	for left hand threads
Steel				**VG**	ISO 2X 6HX	HSS-E	■		
Stainless steel				**VA**	ISO 2 6H	HSS-E	■		
Stainless steel				**VA**	ISO 2 6H	HSS-E	■		
Universal				**UNI**	ISO 2 6H ISO 3 6G	HSS-E	■		with thro‘ coolant
Universal				**UNI**	ISO 2 6H	HSS-E HSS-PM	■		
Universal				**UNI CNC**	ISO 3 6G	HSS-E	■		for synchronised CNC machining with minimum length compensation chuck

Taps Overview

MF – Metric ISO Fine Thread

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Universal				**UNI CNC**	7G ISO 2 6H	HSS-E	■		for synchronised CNC machining with minimum length compensation chuck
Universal				**UNI NC**	ISO 2 6H	HSS-E	■		for synchronised CNC machining with minimum length compensation chuck
Steel				**ST**	ISO 2 6H	HSS-E		□	
Steel				**ST**	ISO 1 4H	HSS-E		□	
Steel				**FE**	ISO 2 6H	HSS-E		□	
Steel				**FE-HF**	ISO 2 6H	HSS-E	■		
Steel				**ST TS**	ISO 2 6H	HSS-E	■		for high-speed machining, up to 100 m/min.
Steel				**ST LH**	ISO 2 6H	HSS-E		□	for left hand threads
Steel				**ST**	ISO 2 6H	HSS-E		□	
Steel				**ST CNC**	ISO 2X 6HX	HSS-E	■		for synchronised CNC machining with minimum length compensation chuck
Stainless steel				**VA**	ISO 2 6H	HSS-E	■		
Stainless steel				**VA**	ISO 2 6H	HSS-E HSS-PM	■	□	
Non-ferrous metals				**NW**	ISO 2 6H	HSS-E	■		
Steel				**ST**	ISO 2X 6HX	HSS-E		□	
Steel				**ST ES**	ISO 2X 6HX	HSS-E		□	extra short
Steel				**ST LH/ES**	ISO 2X 6HX	HSS-E		□	for left hand threads
Steel				**HR**	ISO 2X 6HX	HSS-E	■		
Cast iron				**GG**	ISO 2X 6HX	HSS-E	■		
Tempered steel				**HT**	ISO 2X 6HX	VHM	■		

Taps Overview

MF – Metric ISO Fine Thread

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Machine thread formers				**EC**	ISO 2X 6HX	HSS-E	■		
				**EC SN**	ISO 2X 6HX	HSS-E	■		Thread formers with lubrication grooves
				**UNI**	ISO 2X 6HX	HSS-E	■		
				**UNI SN**	ISO 2X 6HX	HSS-E	■		Thread formers with lubrication grooves
Hand taps				**ST**	ISO 2X 6HX	HSS-E		□	
Dies				**FE**	ISO 6g	HSS		□	
				FE	ISO 6g	HSS		□	
				FE LH	ISO 6g	HSS		□	for left hand threads
				VA	ISO 6g	HSS-E		□	

G – Whitworth Pipe Thread

Universal				**UNI**	ISO 228	HSS-E	■		
				**UNI**	ISO 228	HSS-E	■		
Steel				**ST**	ISO 228	HSS-E		□	
				**FE**	ISO 228	HSS-E		□	
Stainless steel				**VA**	ISO 228	HSS-E	■		
Universal				**UNI**	ISO 228 ISO 228 +0,05	HSS-E	■		
				**UNI**	ISO 228	HSS-E	■		
				**UNI CNC**	ISO 228	HSS-E	■		for synchronised CNC machining with minimum length compensation chuck

Taps Overview

G – Whitworth Pipe Thread

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Steel				**ST**	ISO 228	HSS-E		□	
Steel				**ST**	ISO 228	HSS-E		□	
Stainless steel				**VA**	ISO 228	HSS-E	■		
Steel				**ST**	ISO 228X	HSS-E		□	
Steel				**HR**	ISO 228X	HSS-E	■		
Cast iron				**GG**	ISO 228X	HSS-E	■		
Machine thread formers				**EC**	ISO 228	HSS-E	■		
Machine thread formers				**EC SN**	ISO 228	HSS-E	■		Thread formers with lubrication grooves
Hand taps				**ERGO**	ISO 228	HSS-E		□	
Dies				**FE**	ISO 228A	HSS		□	

UNC – Unified Coarse Thread

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Universal				**UNI**	3B	HSS-E	■		
Universal				**UNI**	2B	HSS-E	■		
Universal				**UNI**	2B	HSS-E	■		
Steel				**ST**	2B	HSS-E		□	
Steel				**FE**	2B	HSS-E		□	
Steel				**FE-HF**	2B	HSS-E	■		
Stainless steel				**VA**	2B	HSS-E	■		
Stainless steel				**VA**	2B	HSS-E	■		

Taps Overview

UNC – Unified Coarse Thread

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Heat-resistant				**Ti**	2BX	HSS-PM	■		
Universal				**UNI**	2B	HSS-E	■		
Universal				**UNI**	2B +0,05	HSS-E	■		
Universal				**UNI**	2B	HSS-E	■		
Steel				**ST**	2B	HSS-E		□	
Steel				**FE**	2B	HSS-E		□	
Steel				**FE-HF**	2B	HSS-E	■		
Stainless steel				**VA**	2B	HSS-E	■		
Stainless steel				**VA**	2B	HSS-E		□	
Heat-resistant				**Ti**	2BX	HSS-PM	■		
Cast iron				**GG**	2BX	HSS-E	■		
Machine thread formers				**EC**	2BX	HSS-E	■		
Machine thread formers				**EC SN**	2BX	HSS-E	■		Thread formers with lubrication grooves
Hand taps				**ERGO**	2BX	HSS-E		□	
Dies				**FE**	2A	HSS-E		□	

EG UNC – Unified coarse thread for wire inserts

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
Universal				**UNI**	2B	HSS-E	■		
Universal				**UNI**	2B	HSS-E	■		

Taps Overview

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
UNJC – Unified Coarse Thread									
Heat-resistant				**Ti**	3BX	HSS-E	■		
UNF – Unified Fine Thread									
Universal				**UNI**	2B	HSS-E	■		
Universal				**UNI**	2B	HSS-E	■		
Steel				**ST**	2B	HSS-E		□	
Steel				**FE**	2B	HSS-E		□	
Stainless steel				**VA**	2B	HSS-E	■		
Heat-resistant				**Ti**	2BX	HSS-PM	■		
Universal				**UNI**	2B 2B +0,05	HSS-E	■		
Universal				**UNI**	2B	HSS-E	■		
Steel				**FE**	2B	HSS-E		□	
Stainless steel				**VA**	2B	HSS-E	■		
Stainless steel				**VA**	2B	HSS-E		□	
Heat-resistant				**Ti**	2BX 3BX	HSS-PM	■		
Cast iron				**GG**	2BX	HSS-E	■		
Thread formers				**EC SN**	2BX	HSS-E	■		Thread formers with lubrication grooves
Dies				**FE**	2A	HSS		□	

Taps Overview

Application range	Through hole	Blind hole	Through hole-Blind hole	Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments
EG UNF – Unified fine thread for wire inserts									
Universal	●			UNI	2B	HSS-E	■		
		●		UNI	2B	HSS-E	■		
UNJF – Unified Extra Fine Thread									
Heat-resistant	●			Ti	3BX	HSS-E	■		
		●		Ti	3BX	HSS-E	■		
BSW – Whitworth Thread									
Universal	●			UNI	med.	HSS-E	■		
		●		UNI	med.	HSS-E	■		
NPT – American Tapered Pipe Thread									
Stainless steel		●		VA		HSS-E	■		
Steel			●	ST AZ		HSS-E		□	with intermittent teeth, reduces friction
			●	VG		HSS-E		□	
			●	VG AZ		HSS-E		□	with intermittent teeth, reduces friction
			●	ST ES		HSS-E		□	extra short
Dies				FE		HSS-E		□	

Taps Overview

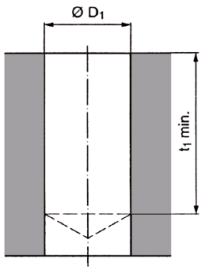
Application range	Through hole	Blind hole	Through hole-Blind hole		Application Area / Special Features	Tolerance	Tap Material	coated ■	uncoated □	Comments

NPTF – American Tapered Pipe Thread

Steel					**ST**		HSS-E		□	
					**VG**		HSS-E		□	
					**ST ES**		HSS-E		□	extra short

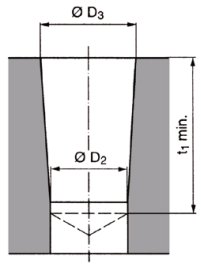
Core hole diameters for taper threads (taper 1:16)

Pre-drilling of cylindrical holes without reamer



		NPT		NPTF				Rc	
Ø D_1 inch	Pitch Gg/1“	Ø D_1 mm	t_1 min. mm	Ø D_1 mm	t_1 min. mm	Ø D_1 inch	Pitch Gg/1“	Ø D_1 mm	t_1 min. mm
1/16	27	6,15	12	6,1	12	1/16	28	6,2	11,9
1/8	27	8,5	12	8,45	12	1/8	28	8,2	11,9
1/4	18	11	17,5	10,9	17,5	1/4	19	10,85	16,3
3/8	18	14,5	17,6	14,3	17,6	3/8	19	14,5	18,1
1/2	14	17,85	22,9	17,6	22,9	1/2	14	18	24
3/4	14	23,2	23	23	23	3/4	14	23,5	25,3
1	11½	29,5	27,4	28,75	27,4	1	11	29,5	30,6
1¼	11½	37,8	28,1	37,5	28,1				
1½	11½	44	28,4	43,75	28,4				
2	11½	56	28,4	55,75	28,4				

Pre-drilling of cylindrical holes and conical boring with reamer

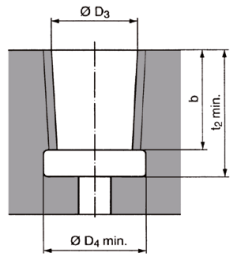


Taper 1:16

		NPT			NPTF		
Ø D_1 inch	Pitch Gg/1“	Ø D_2 mm	Ø D_3 mm	t_1 min. mm	Ø D_2 mm	Ø D_3 mm	t_1 min. mm
1/16	27	5,95	6,39	12	5,95	6,41	12
1/8	27	8,25	8,74	12	8,25	8,76	12
1/4	18	10,75	11,36	17,5	10,75	11,4	17,5
3/8	18	14,1	14,8	17,6	14,1	14,84	17,6
1/2	14	17,5	18,32	22,9	17,5	18,33	22,9
3/4	14	22,7	23,67	23	22,7	23,68	23
1	11½	28,6	29,69	27,4	28,6	29,72	27,4
1¼	11½	37,3	38,45	28,1	37,3	38,48	28,1
1½	11½	43,4	44,52	28,4	43,4	44,5	28,4
2	11½	55,5	56,56	28,4	55,5	56,59	28,4

		Rc		
Ø D_1 inch	Pitch Gg/1“	Ø D_2 mm	Ø D_3 mm	t_1 min. mm
1/16	28	6,1	6,56	11,9
1/8	28	8,1	8,57	11,9
1/4	19	10,75	11,45	17,7
3/8	19	14,25	14,95	18,1
1/2	14	17,75	18,63	24
3/4	14	23	24,12	25,3
1	11	29	30,29	30,6

Recommendation for the pre-drilling of blind hole threads



Taper 1:16

		NPT				NPTF			
Ø D_1 inch	Pitch Gg/1“	Ø D_3 mm	b mm	t_2 min. mm	Ø D_4 mm	Ø D_3 mm	b mm	t_2 min. mm	Ø D_4 min. mm
1/16	27	6,39	7	10	7,6	6,41	8	11	7,4
1/8	27	8,74	7	10	10	8,76	8	11	9,8
1/4	18	11,36	10,2	14,5	13,1	11,4	11,6	15,5	12,9
3/8	18	14,8	10,6	15	16,5	14,84	12	16	16,3
1/2	14	18,32	13,8	19	20,5	18,33	15,6	20,5	20,3
3/4	14	23,67	14,2	20	25,8	23,68	16	21,5	25,6
1	11½	29,69	17	24	32,2	29,72	19,2	26	32
1¼	11½	38,45	17,5	24,5	41	38,48	19,7	26,5	40,8
1½	11½	44,52	17,5	24,5	47,2	44,5	19,7	26,5	47
2	11½	56,56	18	25	59,2	56,59	20,2	27	59

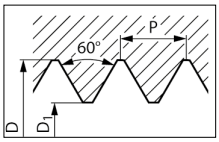
		Rc			
Ø D_1 inch	Pitch Gg/1“	Ø D_3 mm	b mm	t_2 min. mm	Ø D_4 min. mm
1/16	28	6,56	5,6	9,5	7,6
1/8	28	8,57	5,6	9,5	9,6
1/4	19	11,45	8,4	14	13
3/8	19	14,95	8,8	14,4	16,5
1/2	14	18,63	11,4	19	20,6
3/4	14	24,12	12,7	20,3	26
1	11	30,29	14,5	24,3	32,8

Tapped hole pilot diameter

M ISO metric coarse threads

Thread nominal Ø		Ø D_1		Core hole
D	P	min.	max.	
M1	0,25	0,729	0,785	0,75
M1,1	0,25	0,829	0,885	0,85
M1,2	0,25	0,929	0,985	0,95
M1,4	0,3	1,075	1,142	1,1
M1,6	0,35	1,221	1,321	1,25
M1,8	0,35	1,421	1,521	1,45
M2	0,4	1,567	1,679	1,6
M2,2	0,45	1,713	1,838	1,75
M2,5	0,45	2,013	2,138	2,05
M3	0,5	2,459	2,599	2,5
M3,5	0,6	2,850	3,010	2,9
M4	0,7	3,242	3,422	3,3
M4,5	0,75	3,688	3,878	3,7
M5	0,8	4,134	4,334	4,2
M6	1,0	4,917	5,153	5
M7	1,0	5,917	6,153	6
M8	1,25	6,647	6,912	6,8
M9	1,25	7,647	7,912	7,8
M10	1,5	8,376	8,676	8,5
M11	1,5	9,376	9,676	9,5

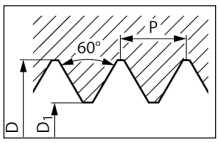
Thread nominal Ø		Ø D_1		Core hole
D	P	min.	max.	
M12	1,75	10,106	10,441	10,2
M14	2,0	11,835	12,210	12
M16	2,0	13,835	14,210	14
M18	2,5	15,294	15,744	15,5
M20	2,5	17,294	17,744	17,5
M22	2,5	19,294	19,744	19,5
M24	3,0	20,752	21,252	21
M27	3,0	23,752	24,252	24
M30	3,5	26,211	26,771	26,5
M33	3,5	29,211	29,771	29,5
M36	4,0	31,670	32,270	32
M39	4,0	34,670	35,270	35
M42	4,5	37,129	37,799	37,5
M45	4,5	40,129	40,799	40,5
M48	5,0	42,587	43,297	43
M52	5,0	46,587	47,297	47
M56	5,5	50,046	50,796	50,5
M60	5,5	54,046	54,796	54,5
M64	6,0	57,505	58,305	58
M68	6,0	61,505	62,305	62



MF ISO metric fine threads

Thread nominal Ø			Ø D_1		Core hole
D	x	P	min.	max.	
M2	x	0,25	1,729	1,774	1,75
M2,2	x	0,25	1,929	1,974	1,95
M2,5	x	0,35	2,121	2,221	2,15
M3	x	0,35	2,621	2,721	2,65
M3,5	x	0,35	3,121	3,221	3,15
M4	x	0,35	3,621	3,721	3,65
M4	x	0,5	3,459	3,599	3,5
M4,5	x	0,5	3,959	4,099	4
M5	x	0,5	4,459	4,599	4,5
M6	x	0,5	5,459	5,599	5,5
M6	x	0,75	5,188	5,378	5,2
M8	x	0,75	7,188	7,378	7,2
M8	x	1,0	6,917	7,153	7
M10	x	0,75	9,188	9,378	9,2
M10	x	1,0	8,917	9,153	9
M10	x	1,25	8,647	8,912	8,8
M12	x	1,0	10,917	11,153	11
M12	x	1,5	10,376	10,676	10,5
M14	x	1,25	12,647	12,912	12,8
M16	x	1,0	14,917	15,153	15
M16	x	1,5	14,376	14,676	14,5

Thread nominal Ø			Ø D_1		Core hole
D	x	P	min.	max.	
M20	x	1,0	18,917	19,153	19
M20	x	1,5	18,376	18,676	18,5
M20	x	2,0	17,835	18,210	18
M24	x	1,5	22,376	22,676	22,5
M30	x	2,0	27,835	28,210	28
M36	x	1,5	34,376	34,676	34,5
M36	x	3,0	32,752	33,252	33
M42	x	2,0	39,835	40,210	40
M48	x	1,5	46,376	46,676	46,5
M48	x	3,0	44,752	45,252	45
M48	x	4,0	43,670	44,270	44
M56	x	1,5	54,376	54,676	54,5
M56	x	2,0	53,835	54,210	54
M56	x	3,0	52,752	53,252	53
M56	x	4,0	51,670	52,270	52
M64	x	3,0	60,752	61,252	61
M64	x	4,0	59,670	60,270	60
M72	x	4,0	67,670	68,270	68
M80	x	6,0	73,505	74,305	74
M95	x	6,0	88,505	89,305	89
M110	x	6,0	103,505	104,305	104



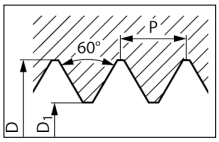
Dimensions in mm; P = Pitch

Thread former pilot hole diameter

M ISO metric coarse threads

Thread nominal Ø		Ø D_1		Core hole
D	P	min.	max.	
M1	0,25	0,89		0,9
M1,2	0,25	1,09		1,1
M1,4	0,3	1,26		1,26
M1,6	0,35	1,45		1,45
M1,8	0,35	1,65		1,65
M2	0,4	1,83	1,86	1,85
M2,2	0,45	2,00	2,04	2,0
M2,5	0,45	2,30	2,34	2,3
M3	0,5	2,77	2,82	2,8
M3,5	0,6	3,23	3,28	3,25
M4	0,7	3,68	3,73	3,7
M4,5	0,75	4,15	4,21	4,15
M5	0,8	4,63	4,68	4,65

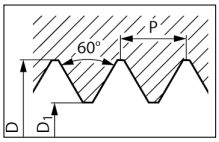
Thread nominal Ø		Ø D_1		Core hole
D	P	min.	max.	
M6	1	5,51	5,59	5,55
M7	1	6,51	6,59	6,55
M8	1,25	7,39	7,48	7,4
M9	1,25	8,39	8,48	8,4
M10	1,5	9,25	9,35	9,3
M11	1,5	10,25	10,35	10,3
M12	1,75	11,12	11,25	11,2
M14	2	13,00	13,15	13,0
M16	2	15,00	15,15	15,0
M18	2,5	16,72	16,90	16,8
M20	2,5	18,72	18,90	18,8
M22	2,5	20,72	20,9	20,8
M24	3	22,46	22,7	22,5



MF ISO metric fine threads

Thread nominal Ø			Ø D_1		Core hole
D	x	P	min.	max.	
M2	x	0,25	1,89		1,9
M2,2	x	0,25	2,09		2,1
M2,5	x	0,25	2,39		2,4
M2,5	x	0,35	2,35		2,35
M3	x	0,25	2,89		2,9
M3	x	0,35	2,85		2,85
M3,5	x	0,35	3,35		3,35
M3,5	x	0,5	3,27	3,32	3,3
M4	x	0,35	3,85		3,85
M4	x	0,5	3,77	3,82	3,8
M4,5	x	0,5	4,27	4,32	4,3
M5	x	0,5	4,77	4,82	4,8
M5	x	0,75	4,65	4,71	4,65
M5,5	x	0,5	5,27	5,32	5,3
M6	x	0,5	5,78	5,83	5,8
M6	x	0,75	5,65	5,71	5,65
M7	x	0,5	6,78	6,83	6,8
M7	x	0,75	6,65	6,71	6,65
M8	x	0,5	7,78	7,83	7,8
M8	x	0,75	7,65	7,71	7,65
M8	x	1,0	7,51	7,59	7,55
M9	x	0,5	8,78	8,83	8,8
M9	x	0,75	8,65	8,71	8,65
M9	x	1,0	8,51	8,59	8,55
M10	x	0,5	9,78	9,83	9,8
M10	x	0,75	9,65	9,71	9,65
M10	x	1,0	9,51	9,59	9,55
M10	x	1,25	9,39	9,48	9,4
M11	x	0,75	10,65	10,71	10,7
M11	x	1,0	10,51	10,59	10,5
M12	x	0,75	11,66	11,72	11,7

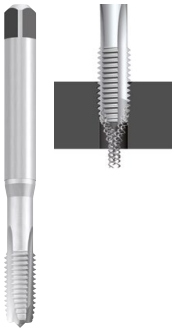
Thread nominal Ø			Ø D_1		Core hole
D	x	P	min.	max.	
M12	x	1,0	11,52	11,6	11,5
M12	x	1,25	11,4	11,49	11,4
M12	x	1,5	11,26	11,36	11,3
M13	x	0,75	12,66	12,72	12,7
M13	x	1,0	12,52	12,6	12,5
M13	x	1,5	12,26	12,36	12,3
M14	x	0,75	13,66	13,72	13,7
M14	x	1,0	13,52	13,6	13,5
M14	x	1,25	13,4	13,49	13,4
M14	x	1,5	13,26	13,36	13,3
M15	x	0,75	14,66	14,72	14,7
M15	x	1,0	14,52	14,6	14,5
M15	x	1,5	14,26	14,36	14,3
M16	x	0,75	15,66	15,72	15,7
M16	x	1,0	15,52	15,6	15,5
M16	x	1,5	15,26	15,36	15,3
M18	x	1,0	17,52	17,6	17,5
M18	x	1,5	17,26	17,36	17,3
M18	x	2,0	17	17,15	17
M20	x	1,0	19,52	19,6	19,5
M20	x	1,5	19,26	19,36	19,3
M20	x	2,0	19	19,15	19
M22	x	1,5	21,26	21,36	21,3
M22	x	2,0	21	21,15	21
M24	x	1,5	23,26	23,38	23,3
M24	x	2,0	23,01	23,16	23
M25	x	1,5	24,26	24,38	24,3
M26	x	1,5	25,26	25,38	25,3
M27	x	2,0	26,01	26,16	26
M28	x	1,5	27,26	27,38	27,25
M30	x	1,5	29,26	29,38	29,25
M30	x	2,0	29,01	29,16	29



Dimensions in mm; P = Pitch

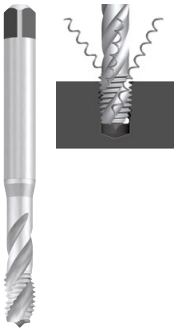
Tap Type Explanation

Through hole tap



- for through holes up to 4xD
- lead form B: 3.5–5 cutting leads, with spiral point
- straight Flutes
- also suitable for synchronised machining, with Wedlon flat and with extra long version
- due to the special geometry of the flutes, the chips are removed in the direction of cut

Blind hole tap



- for blind holes up to 3xD
- lead form C: 2–3 cutting leads, without spiral point
- lead form E: 1.5–2 cutting leads, without spiral point
- (35°, 42°, 45°, 50°) right hand helix
- also suitable for syncronised machining, with Weldon flat, with extra long version and through coolant
- the high helix angle ensures chips are discharged effectively against the direction of cut

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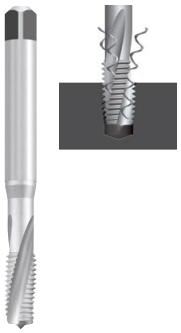
Through and blind hole tap

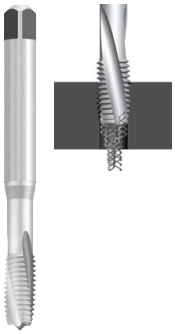
- for blind and through holes up to 2xD
- lead form C: 2–3 cutting leads, without spiral point
- lead form D: 3.5–5 cutting leads, without spiral point
- lead form E: 1.5–2 cutting leads, without spiral point
- straight Flutes
- for steel, short chipping and hardened materials to 55 (62) HRc
- also with extra long version and through coolant

Blind hole tap



- for blind holes up to 2xD
- lead form C: 2–3 cutting leads, without spiral point
- lead form E: 1.5–2 cutting leads, without spiral point
- (15°, 25°, 30°) slow right hand helix
- for steel, titanium alloys and Inconel 718
- also suitable for synchronised machining, with extra long version and through coolant
- also suitable for difficult operating conditions such as cross holes

Through hole tap

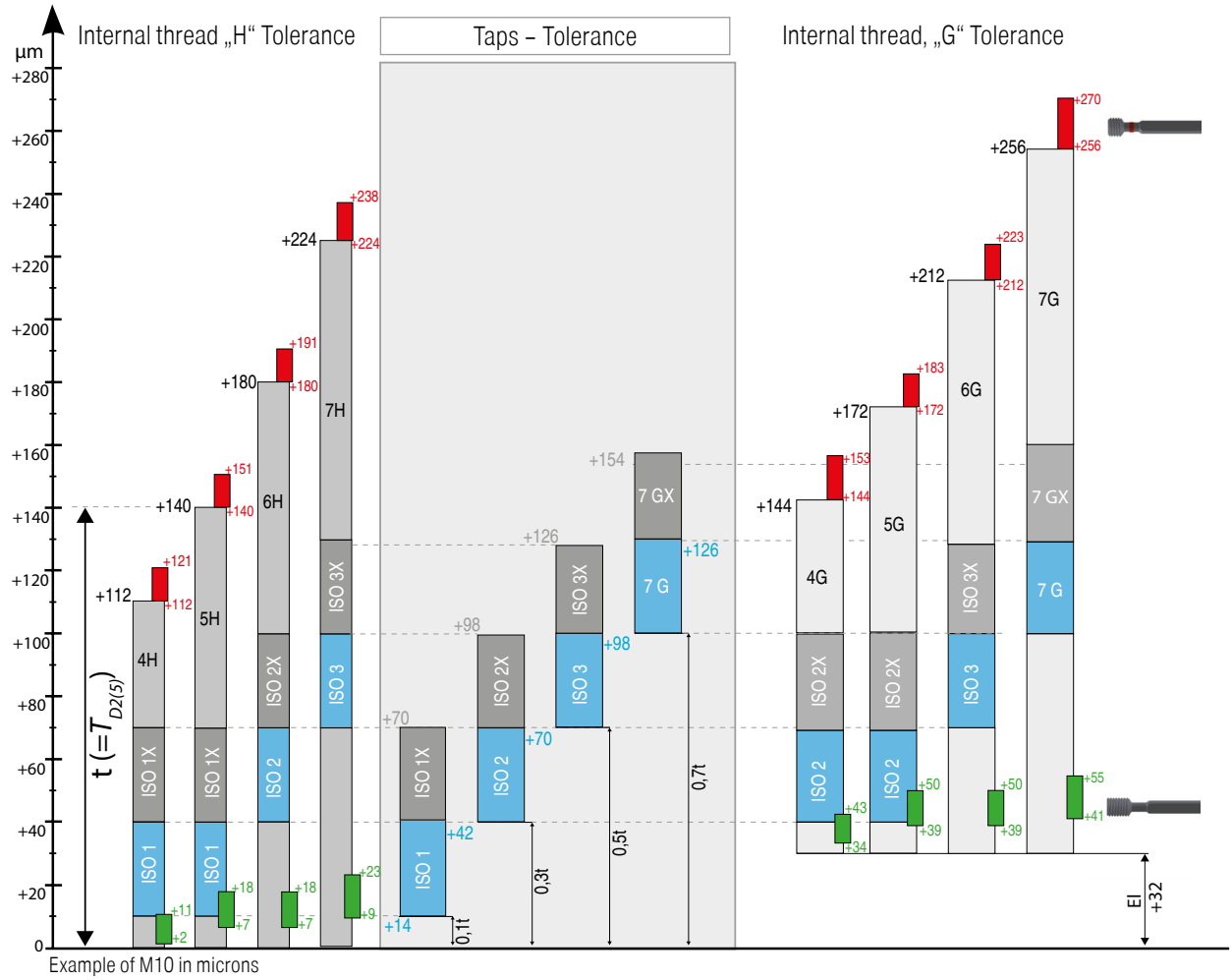


- for through holes up to 4xD
- lead form C: 3.5–5 cutting leads, without spiral point
- 15° left hand helix
- suitable for steel, titanium alloys and Inconel 718
- the chips are discharged in the direction of cut

Thread former

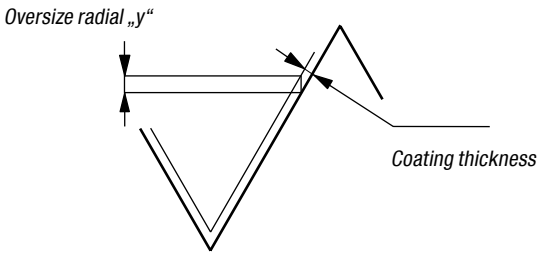
- for blind and through holes up to 3xD
- lead form C: 2–3 cutting leads, without spiral point
- for cold formable materials up to 1400 N/mm^2
- suitable for synchronised machining, with lubrication grooves and internal cooling

Thread tolerances and recommended manufacturing tolerances



Workpieces to be plated require oversize taps.
The interference depends on the coating thickness and the flank angle.

at	60° Flank angle	Oversize ≙ 4 x coating thickness
	55° Flank angle	Oversize ≙ 4.331 x coating thickness
	30° Flank angle	Oversize ≙ 7.727 x coating thickness



Troubleshooting

Poor tool life

Cause

- overload fractures of the cutting edge on the lead
- hardness or tool material not suitable for the application
- core hole too small, or work hardened
- insufficient lubrication or incorrect application parameters

Remedy

- a longer lead or more flutes for the same lead length, giving a greater number of cutting teeth
- in reground tools the hardness can be reduced, apply correct parameters for regrinding
- increase frequency of changes or regrinding of the drill
- use the correct operating parameters for drilling
- select the correct lubricant and ensure adequate supply

Axial thread error

Cause

- selected geometry is not suitable
- spindle speed is wrong compared with feed (synchronisation error)
- blind hole taps are used with high feed pressure
- through hole taps are used with low feed pressure

Remedy

- check programming and pitch control or machine synchronisation
- use tapping chuck with length compensation
- increase retraction feed pessure
- increase feed pessure

Oversize thread

Cause

- thread tolerances of tool and thread gauge do not match
- burred tool edges after regrinding
- cold pressure welding

Remedy

- check the correct tolerances for tool and thread gauge
- carefully deburr
- use appropriate (positive) geometry
- reduce cutting speed
- use different surface treatment or coating
- use tapping chuck with length compensation
- use appropriate lubricant

Broken tool

Cause

- tool is worn
- tool has hit the bottom of the hole
- weld deposits
- core hole too small
- chip trapping
- incorrect cutting speed
- chip trapping in the flute
- insufficient cooling / lubrication

Remedy

- employ set taps
- use a tool with lower helix
- use tools with a shorter / longer lead
- check the pre-drilling depth and the thread depth
- drill core hole deeper
- correct cutting speed
- use a different coating or surface treatment
- use tool holder with length compensation
- use suitable lubricant
- use correct core hole
- change geometry and / or flute type
- note chip shape and chip formation