Complete range

Threading tools

STOCK

Chip – by Chip – to the Top

Threading tools for every application

- wide range of thread forms
- thread cutting, forming and milling
- for all hole types
- with or without internal cooling
- all cutting materials ranging from carbide, PM steels to HSS-E
- application-orientated coatings

ISO-CODES

P	Steel, high-alloyed steel
M	Stainless steel
K	Grey cast iron, spheroidal and malleable cast iron
N	Aluminium and other non-ferrous metals
S	Special-, super- and Ti-alloys
H	Hardened steel and hard cast iron

PICTOGRAMS

HOLE TYPE

Through hole, short

Through hole, 1 x D

Through hole, 2 x D

Blind hole, 1 x D

Blind hole, 2 x D

Blind hole down to the bottom of the hole

COLOURED BAND

General steels ≤ 800 N/mm²

High tensile steels 1100-1400 N/mm²

Stainless and acid-resisting steel

Universal applications < 1100 N/mm²

Cast materials

Aluminium and Al-alloys

STOCK

STANDARD TYPES

PRODUKTIV

Types N, W, H, HD, HDX, HX, N-X and
Synchro Machine taps with straight flutes and spiral point
for machine tapping of through holes

INTENSIV

Types N, W, H, HD, HDX, HX, HCX, N-X
and Synchro Machine taps with spiral flutes
10°,15°, 25°, 40°, 45° and 50° for blind holes

MASSIV

Type N
Spiral point taps for machine tapping of through holes in sheet metal,
punched or drilled

DURATIV

Types N, N-X
Cold forming taps, with and without oil grooves

STOCK

SOLUTIONS

We manufacture special threading tools, like taps, cold forming taps or thread milling cutters, with or without internal coolant supply, also for dry machining, minimal lubrication and for threads in hardened material. To achieve best results, tools are bright-finished, steam tempered, nitrided or coated with e.g. TiN, TiCN, TiAlN or/and MoS_2 (for better lubrication).

Application recommendations for taps

Universal applications

Hole type		
Tool material	HSS-E	HSS-E
Type	ProduktivN-X	IntensivN-X
Form	B	C
Surface finish	AlTiZrN	TiAlN-H

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range	
M	DIN 371	6HX	53733 M2 - M10	53746 M2 - M10
	DIN 376	6HX	53733 M12 - M30	53746 M12 - M30
MF	DIN 374	6HX	53778 M 6x1 - M 24x1.5	53780 M 6x0.75 - M 24x1.5
G	DIN 5156		53787 G1/16 - G1	53788 G1/16 - G1

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min	
P	Structural and free cutting steels, unalloyed heat-treatable steels	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	**25**	**20**
P	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	**20**	**15**
P	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	**15**	**10**
M	Stainless steels, sulphured, austenitic	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	**10**	**15**
M	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	**12**	**10**
M	Duplex and Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	**8**	**6**
K	Grey cast iron, spheroidal and malleable cast iron				25	20
N	Aluminum, non-ferrous metals and plastics				**30**	**35**
S	Special-, Super- and Titanium alloys				2-3	2-3

Application recommendations for taps

Universal applications

Hole type					
Tool material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Type	Produktiv N	Produktiv N	Produktiv N	Produktiv N	Produktiv N
Form	B	B	C	C	E
Surface finish	steam tempered	TiN	steam tempered	TiN	bright

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range				
M	DIN 371	ISO 2 6H	73033 M3 - M10	63033 M3 - M10	73046 M3 - M10	63046 M3 - M10	73047 M4 - M10
	DIN 376	ISO 2 6H	73038 M12 - M16	63033 M12 - M20	73048 M12 - M20	63048 M12 - M20	
MF	DIN 374	ISO 2 6H	73183 M6x0.75 - M20x1.5		73187 M6x0,75 - M20x1.5		
UNC	~ DIN 371	2B	73308 No.4-40 - 3/8-16		73322 No.4-40 - 3/8-16		
	~ DIN 376	2B	73309 1/2-13 - 3/4-10		73323 1/2-13 - 3/4-10		
UNF	~ DIN 374	2B	73310 No.10-32 - 5/8-18		73324 No.10-32 - 5/8-18		
G	DIN 5156		73321 G1/8 - G1		73325 G1/8 - G1		

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min				
P	Structural and free cutting steels, unalloyed heat-treatable steels	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	**12**	**15**	**10**	**15**	**10**
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	**10**	**12**	**8**	**10**	**8**
	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	6	8	6	8	4

Application recommendations for taps

Universal applications

Hole type			
Tool material	HSS-E-PM	HSS-E-PM	HSS-E
Type	Produktiv-Synchro	Produktiv-Synchro	H
Form	B	C	C
Surface finish	TiCN	TiCN	TiCN

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range		
M	DIN 371	ISO 2 6H	53053 M2 - M10		
		6HX		53050 M5 - M10	
	DIN 376	ISO 2 6H	53054 M12 - M20		
		6HX		53051 M12 - M20	53646 M16 - M39
	~ DIN 376	6HX			53647 (Company std., extra length) M16 - M39
MF	DIN 374	ISO 2 6H	53055 M8x1 - M16x1.5		
		6HX		53052 M8x1 - M20x1.5	

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min		
P	Structural and free cutting steels, unalloyed heat-treatable steels	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	**20**	**20**	
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	**15**	**15**	**15**
	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	**10**	10	**12**
K	Cast iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030			**25**
	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070			**20**
	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400				**15**

Application recommendations for taps

Stainless and acid-resisting steel

Hole type				
Tool material	HSS-E	HSS-E	HSS-E-PM	HSS-E-PM
Type	Produktiv HD	Produktiv HD	Produktiv HD	Produktiv HD
Form	B	B	B	B
Surface finish	steam tempered	TiN	bright	TiCN

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range			
M	DIN 371	ISO 2 6H	73176 M3 - M10	63176 M3 - M10	73641 M3 - M10	53641 M3 - M10
	DIN 376	ISO 2 6H	73177 M12 - M20	63177 M12 - M16	73643 M12 - M22	53643 M12 - M22
MF	DIN 374	ISO 2 6H	73178 M5x0.5 - M20x1.5			
UNC	~ DIN 371	2B	73297 No.4-40 - 3/8-16			
	~ DIN 376	2B	73298 1/2-13 - 1-8			
UNF	~ DIN 374	2B	73299 No.10-32 - 5/8-18			
G	DIN 5156		73300 G1/8 - G1			
NPT	Company std.		73293 1/8 - 3/4			

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min			
M	Stainless steels, sulphured, austenitic	≤1000 N/mm²	X5CrNi18-10	1.4301	**8**	**10**	**8**	**10**
			X6CrNiTi18-10	1.4571				
			X8CrNiS18-9	1.4305				
	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	X17CrNi16-2	1.4057	**6**	**8**	**6**	**8**
			X90CrMoV18	1.4112				
			X2CrTi12	1.4512				
	Duplex and Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3	1.4462				
			X2CrNiMoN25-7-4	1.4410				
			X2CrNiMoCuWN25-7-4	1.4501				

Application recommendations for taps

Stainless and acid-resisting steel

Hole type				
Tool material	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E-PM
Type	Intensiv HD	Intensiv HD	Intensiv HD	Intensiv HD
Form	C	C	C	C
Surface finish	steam tempered	bright	TiCN	TiN

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range			
M	DIN 371	ISO 2 6H	73660 M3 - M10	73662 M3 - M10	53662 M3 - M10	63662 M3 - M10
	DIN 376	ISO 2 6H	73659 M12 - M20	73665 M12 - M24	53665 M12 - M24	
MF	DIN 374	ISO 2 6H	73180 M8x1 - M20x1.5			
UNC	~ DIN 371	2B	73304 No.4-40 - 3/8-16			
	~ DIN 376	2B	73305 1/2-13 - 3/4-10			
UNF	~ DIN 374	2B	73306 No.10-32 - 3/4-16			
G	DIN 5156		73288 G1/8 - G1			
NPT	Company std.					

Material group		Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min			
M	Stainless steels, sulphured, austenitic	≤1000 N/mm²	X5CrNi18-10	1.4301	**6**	**8**	**10**	**10**
			X6CrNiTi18-10	1.4571				
			X8CrNiS18-9	1.4305				
	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	X17CrNi16-2	1.4057	**4**	**6**	**6**	**6**
			X90CrMoV18	1.4112				
			X2CrTi12	1.4512				
	Duplex and Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3	1.4462				
			X2CrNiMoN25-7-4	1.4410				
			X2CrNiMoCuWN25-7-4	1.4501				

Application recommendations for taps




Hole type				
Tool material	HSS-E-PM	HSS-E-PM	HSS-E-PM	HSS-E-PM
Type	Produktiv HDX	Intensiv HDX	Produktiv HX	Intensiv HX
Form	B	C	B	B
Surface finish	TiCN	TiCN	TiAlN	TiAlN

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range			
M	DIN 371	ISO 2 6H				
		6HX	53667 M3 - M16	53666 M3 - M16	53669 M3 - M16	53668 M3 - M16
	DIN 376	ISO 2 6H				

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min			
S	Titanium and Titanium alloys	≤1200 N/mm²	Titanium	3.7025	**4**	**4**		
			TiAl5Sn2	3.7115				
			TiAl6V4	3.7165				
	Nickel, cobalt, iron alloys	≤1400 N/mm²	Hastelloy C4	2.4610			**4**	**4**
			Inconel 718	2.4668				
			Nimonic 105	2.4634				

Application recommendations for taps

High tensile steels

Hole type					
Tool material	HSS-E	HSS-E	HSS-E-PM	HSS-E-PM	HSS-E-PM
Type	Produktiv H	Produktiv H	Produktiv H	Produktiv H	Produktiv H
Form	B	B	B	B	B
Surface finish	nitrided	TiCN	bright	TiN	TiCN

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range				
M	DIN 371	ISO 2 6H	73642 M2 - M10	53642 M2 - M10	73640 M3 - M10	63641 M3 - M10	53640 M3 - M10
	DIN 376	ISO 2 6H	73645 M12 - M20			63643 M12 - M20	53640 M12 - M16
MF	DIN 374	ISO 2 6H	73646 M3x0.35 - M22x1.5				

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min				
P	Structural and free cutting steels, unalloyed heat-treatable steels	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718					
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	6	6	8	10	10
	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	**10**	**12**	**12**	**15**	**15**

Application recommendations for taps

High tensile steels

Hole type				
Tool material	HSS-E	HSS-E	HSS-E	HSS-E-PM
Type	Intensiv H	Intensiv H	Intensiv H	Intensiv H
Form	C	C	C	C
Surface finish	bright	TiCN	TiN	bright

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range			
M	DIN 371	ISO 2 6H	73661 M3 - M10	53661 M2 - M10	63674 M3 - M10	73619 M3 - M10
		6HX				
	DIN 376	ISO 2 6H	73664 M12 - M20	53661 M12 - M16	63675 M12 - M20	73666 M12 - M20
MF	DIN 374	ISO 2 6H				

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min			
P	Structural and free cutting steels, unalloyed heat-treatable steels	≤800 N/mm²	S235JR	1.0037				
			C15	1.0401				
			11SMnPb30	1.0718				
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2	1.0577				
			C60	1.0601				
			31CrMo12	1.8515				
	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4	1.7225	6	10	10	4
			36CrNiMo4	1.6511				
			X36CrMo17	1.2316				
			HS 6-5-2	1.3343				

Application recommendations for taps

High tensile steels

Hole type		max. 1.5 x D	
Tool material	HSS-E-PM	Solid carbide	HSS-E-PM
Type	H	H	HCX
Form	D	D	C
Surface finish	TiCN	TiCN	TiCN

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range		
M	DIN 371	ISO 2 6H			
		6HX	53676 M3 - M16		53670 M5 - M10
	Company std. ~ DIN 371	ISO 2 6H		63010 M3 - M12	

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min		
P	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515			15
P	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343			12
K	Cast iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030			30
K	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070			20
K	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400				15
N	Al cast alloys	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581			30
H	High tensile steels, hardened steels	45-55 HRC	Hardox 500		3		
H		55-62 HRC				2	

Application recommendations for taps

General steels

Hole type				
Tool material	HSS-E	HSS-E	HSS-E	HSS-E
Type	Massiv N	N	Produktiv N	Produktiv N
Form	B	C	B	B
Surface finish	bright	bright	bright	TiN

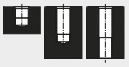
Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range			
M	DIN 371	ISO 2 6H	73126 M2.3 - M10	73185 M2 - M10	73133 M2 - M10	63133 M3 - M10
		ISO 3 6G			73132 M2 - M10	
	DIN 376	ISO 2 6H		73191 M3 - M22	73138 M3 - M24	63138 M12 - M20
MF	DIN 374	ISO 2 6H		73237 M3x0.35 - M26x1.5	73250 M4x0.50 - M24x2	63250 M8x1 - M20x1.5
G	DIN 5156					

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min			
P	Structural and free cutting steels, unalloyed heat-treatable steels	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	**10**	**6**	**10**	**10**
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515			6	**8**
	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343				

Application recommendations for taps



General steels

Hole type			
Tool material	HSS-E	HSS-E	HSS-E
Type	Intensiv N	Intensiv N	Intensiv N
Form	C	C	C
Surface finish	bright	bright	TiN

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range		
M	DIN 371	ISO 2 6H	73221 M2 - M10	73146 M2 - M10	63146 M3 - M10
		ISO 3 6G		73145 M3 - M10	
	DIN 376	ISO 2 6H	73227 M3 - M20	73148 M3 - M30	63148 M12 - M20
MF	DIN 374	DIN 374		73173 M3x0.35 - M24x2	63173 M8x1 - M20x1.5
G	DIN 5156			73286 G1/8 - G1 1/2	

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min		
P	Structural and free cutting steels, unalloyed heat-treatable steels	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	**8**	**8**	**12**
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515			
	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343			

Application recommendations for taps

○ Aluminium and Al-alloys

Hole type				
Tool material	HSS-E	HSS-E	HSS-E-PM	Solid carbide
Type	Produktiv W	Intensiv W	HCX	H
Form	B	C	C	
Surface finish	bright	bright	TiCN	bright

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range			
M	DIN 371	ISO 2 6H	73131 M2 - M10	73156 M2 - M10		73011 M3 - M10
		6HX			53670 M5 - M10	
	DIN 376	ISO 2 6H	73189 M12 - M20	73136 M12 - M20		

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min			
P	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515			15	
P	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343			12	
K	Cast iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030			30	
K	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070			20	
K	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400				15	
N	Aluminium, Aluminium wrought alloys	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 32315 3.4335	15	15		
N	Aluminium cast alloys	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581			30	50
N	Magnesium alloys	≤500 N/mm²	GDMgAl8Zn1	3.5812.08				50
N	Copper and copper alloys	long-chipping short-chipping	CuZn20 CuZn37Pb0,5 CuZn39Pb2 CuZn43Pb2	2.0250 2.0332 2.0380 2.0410	15	15		50
N	Copper special alloys	≤1400 N/mm²	Ampco					

Application recommendations for taps

Cast materials

Hole type		
Tool material	HSS-E	HSS-E
Type	G	G
Form	C	C
Surface finish	nitrided	TiAlN

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range	
M	DIN 371	ISO 2 6H		
		6HX	73201 M3 - M10	63201 M3 - M10
	DIN 376	6HX	73211 M12 - M22	
MF	DIN 374	6HX	73194 M8x1 - M20x1.5	
UNC	~ DIN 371	2B	73326 No.8-32 - 3/8-16	
	~ DIN 376	2B	73327 1/2-13 - 1-8	
G	DIN 5156		73345 G1/8 - G1	

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min	
K	Cast iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	**15**	**25**
	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	**10**	**20**
	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		8	**15**

Application recommendations for taps

Cast materials

Hole type		
Tool material	HSS-E-PM	Solid carbide
Type	HCX	H
Form	C	
Surface finish	TiCN	bright

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range	
M	DIN 371	ISO 2 6H		73011 M3 - M10
		6HX	53670 M5 - M10	

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min	
P	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	**15**	
P	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	**12**	
K	Cast iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030	**30**	**45**
K	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	**20**	**35**
K	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		**15**	**30**
N	Aluminium cast alloys	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	**30**	**50**
N	Magnesium alloys	≤500 N/mm²	GDMgAl8Zn1	3.5812.08		**50**
N	Copper and copper alloys	long-chipping short-chipping	CuZn20 CuZn37Pb0,5 CuZn39Pb2 CuZn43Pb2	2.0250 2.0332 2.0380 2.0410		**50**

Application recommendations for hand taps, short machine- and special taps

Hole type				
Tool material	HSS	HSS-E	HSS-E	HSS-E
Type	N	N	N	N
Form		B	Combination	
Surface finish	bright	bright	bright	bright

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range			
M	DIN 352	ISO 2 6H	73531 (Set) RH: V 73101 / M 73102 / F 73103 M1 - M22 73532 (Set) LH: V 73105 / M 73106 / F 73107 M4 - M20			73243 M3 - M30
	Company std.	ISO 2 6H			73248 M3 - M12	
MF	DIN 2181	ISO 2 6H	73521 (Set): V 73110 / F 73111 M4x0.35 - M40x1.5			
UNC	~ DIN 352	2B	73535 (Set): V 73301 / M 73302 / F 73303 No.4-40 - 3/4-10			
UNF	~ DIN 2181	2B	73523 (Set): V 73319 / F 73320 5/16-24 - 1-12			
BSW	~ DIN 352		73534 (Set): V 73311 / M 73312 / F 73313 W1/8 - W2			
G	DIN 5157		73522 (Set): V 73315 / F 73316 G1/8 - G2			
Pg	DIN 40432			73296 Pg7 - PG16		

	Material group	Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min			
P	Structural and free cutting steels, unalloyed heat-treatable steels	≤800 N/mm²				**10**	**6**	**6**
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²					6	**8**
	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²						

Application recommendations for cold forming taps

Tool material	HSS-E	HSS-E	HSS-E	HSS-E-PM	Solid carbide
Type	Durativ	Durativ	Durativ	Durativ	Durativ
Form	C without oil grooves	C with oil grooves	C with oil grooves	C with oil grooves	C with oil grooves
Surface finish	TiN	blank	TiN	AlCrN	TiCN
Coolant	without	without	without	without	radial

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range				
M	~ DIN 371	4/6HX	63121 M2 - M10	73120 M3 - M10	63120 M3 - M10	53620 M3 - M10	63013 M3 - M10
		6GX			63119 M3 - M10	53621 M3 - M10	
	~ DIN 376	6HX	63123 M16 - M20		63122 M12 - M16	53622 M12 - M20	
		6GX					
MF	~ DIN 374	6HX			63703 M8x1 - M16x1.5		

	Material group	Tensile strength	Recommended cutting speed v_c m/min				
P	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	**10**	**11**	**12**	**12**	**25**
M	Stainless steels, sulphured, austenitic	≤1000 N/mm²	**4**	**5**	**6**		**15**
M	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	**4**	**3**	**4**		**12**
M	Duplex and Super Duplex	≤1300 N/mm²					**15**
K	Spheroidal and malleable cast iron	from GGG40	**15**	**14**	**15**		40
N	Aluminum, non-ferrous metals and plastics		**20**	**18**	**20**		**45**
S	Special-, Super- and Titanium alloys						**10**

Application recommendations for cold forming taps

Hole type			
Tool material	HSS-E-PM	HSS-E-PM	HSS-E-PM
Type	Durativ N-X	Durativ N-X	Durativ N-X
Form	C with oil grooves	C with oil grooves	E
Surface finish	TiCN	TiCN	TiCN
Cooling	external	radial	axial*

Thread type	Dimensions to DIN 2184-1	Tolerance zone	Catalogue no./Ø-range		
M	~ DIN 371	4/6HX	53630 M1-M10	53610 M5-M20	53618 M2*-M10
		6GX	53631 M2-M10		
	~ DIN 376	6HX	53630 M12-M20		53618 M12-M20
		6GX	53631 M12-M20		
MF	~ DIN 374	6HX	53632 M8x1-M20x1.5	53612 M8x1-M20x1.5	53619 M8x1-M20x1.5
UNC	~ DIN 371 ~ DIN 376	2BX	53633 No.4-40 - 3/4-10		
UNF	~ DIN 374	2BX	53634 No.4-48 - 3/4-16		
G	DIN 5156	X	53635 G1/8 - G1/2		

Recommended cutting speed v_c m/ min, see page 23.

All tools from M2 with oil grooves.
* from M5 with IC

Application recommendations for cold forming taps

Material group			Tensile strength	Example materials	Material no.	Recommended cutting speed v_c m/min		
P	P1	Structural and free cutting steels, heat-treatable steels unalloyed	≤800 N/mm²	S235JR C15 11SMnPb30	1.0037 1.0401 1.0718	25	25	25
	P2	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	S355J2 C60 31CrMo12	1.0577 1.0601 1.8515	25	25	25
	P3	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	42CrMo4 36CrNiMo4 X36CrMo17 HS 6-5-2	1.7225 1.6511 1.2316 1.3343	15	15	15
M	M1	Stainless steels, sulphured, austenitic	≤1000 N/mm²	X5CrNi18-10 X6CrNiTi18-10 X8CrNiS18-9	1.4301 1.4571 1.4305	15	15	15
	M2	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	X17CrNi16-2 X90CrMoV18 X2CrTi12	1.4057 1.4112 1.4512	10	10	10
	M3	Duplex and Super Duplex	≤1300 N/mm²	X2CrNiMoN22-5-3 X2CrNiMoN25-7-4 X2CrNiMoCuWN25-7-4	1.4462 1.4410 1.4501	6	6	6
K	K1	Cast iron	300 HB	EN-GJL-150 EN-GJL-250 EN-GJL-300	0.6015 0.6025 0.6030			
	K2	Spheroidal graphite iron and malleable cast iron	350 HB	EN-GJS-400-15 EN-GJS-600-3 EN-GJS-700-2	0.7040 0.7060 0.7070	30	30	30
	K3	ADI GGV	1000 N/mm² 350 HB	EN-GJS1000-5 EN-GJV250 EN-GJV400		25	25	25
N	N1	Aluminium, Aluminium wrought alloys	≤450 N/mm²	Al99,5H AlMgSi1 AlZn4,5Mg	3.0250 3.2315 3.4335	15	15	15
	N2	Aluminium cast alloys	≤600 N/mm²	GD-AlSi5Cu1Mg GD-AlSi8Cu3 G-AlSi9Mg G-AlSi12	3.2134 3.2162 3.2373 3.2581	30	30	30
	N3	Magnesium alloys	≤500 N/mm²	GDMgAl8Zn1	3.5812.08			
	N4	Copper and copper alloys	long-chipping	CuZn20 CuZn37Pb0,5	2.0250 2.0332	30	30	30
			short-chipping	CuZn39Pb2 CuZn43Pb2	2.0380 2.0410			
	N5	Copper special alloys		Ampco				
	N6	Plastics [Thermoplastics, duroplastics]	long-chipping short-chipping	PMMA, POM, PVC Pertinax				
S	S1	Titanium and Titanium alloys	≤1200 N/mm²	Titanium TiAl5Sn2 TiAl6V4	3.7025 3.7115 3.7165	8	8	8
	S2	Nickel, cobalt, iron alloys	≤1400 N/mm²	Hastelloy C4 Inconel 718 Nimonic 105	2.4610 2.4668 2.4634	8	8	8
H	H1	High tensile steels, hardened steels	45 - 55 HRC					
	H2		55 - 62 HRC					

Application recommendations for thread milling cutters

NEW
CNC programme

Hole type				
Tool material	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Type	TM SP	TMC SP	TMU SP	TM SP
Surface finish	TiCN	TiCN	TiCN	TiCN

Thread type	Dimensions to	Thread depth	Catalogue no./Ø-range			
M	Company std.	2.0 x D		53810 M3 - M20	73830	53830 M6 - M20
		2.5 x D	53860 M6 - M20			
MF	Company std.	2.0 x D		53820 M4x0.5 - M16x1.5	73830	53830 M8x1 - M20x1.5
		3.0 x D				

Material group		Tensile strength	Application recommendations			
P	Structural and free cutting steels, heat treated unalloyed steels	≤800 N/mm²	++	++	++	++
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	++	++	++	++
	Heat treated alloy steels, tool steels, high speed steels	800 - 1200 N/mm²	+	++	++	+
M	Stainless steels, sulphured, austenitic	≤1000 N/mm²	+	++	++	+
	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	+	++	++	+
	Duplex and Super Duplex	≤1300 N/mm²	+	++	++	+
K	Grey cast iron, spheroidal and malleable cast iron		++	++	++	++
N	Aluminum, non-ferrous metals and plastics		++	++	++	++
S	Special-, Super- and Titanium alloys		+	++	++	+
H	High tensile steels, hardened steels	45-55 HRC	+	++	+	+
		55-62 HRC				

++ optimally suited | + suited

Application recommendations for thread milling cutters

Hole type		
Tool material	Solid carbide	Solid carbide
Type	TM SP	TM SP
Surface finish	TiCN	TiAlN

Thread type	Dimensions to	Thread depth	Catalogue no./Ø-range	
M	Company std.	2.0 x D		
		3.0 x D	53840 M1.6 - M16	53850 M2 - M12

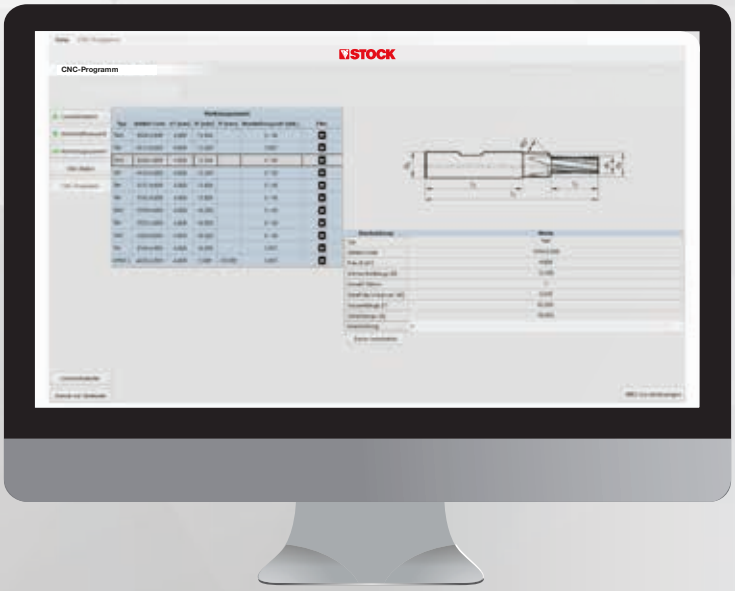
	Material group	Tensile strength	Application recommendations	
P	Structural and free cutting steels, unalloyed heat-treatable steels	≤800 N/mm²	++	
	Free-cutting steels, unalloyed case hardened steels, nitriding steels	800 - 1000 N/mm²	++	
	Alloyed heat-treatable steels, tool steels, high speed steels	800 - 1200 N/mm²	++	
M	Stainless steels, sulphured, austenitic	≤1000 N/mm²	++	
	Stainless- and acidresistant steels, martensitic	≤1000 N/mm²	++	
	Duplex and Super Duplex	≤1300 N/mm²	++	
K	Grey cast iron, spheroidal and malleable cast iron		++	
N	Aluminum, non-ferrous metals and plastics		++	
S	Special-, Super- and Titanium alloys		++	+
H	High tensile steels, hardened steels	45-55 HRC	+	++
		55-62 HRC		++

++ optimally suited | + suited

Free CNC programme

Thread milling cutters and drill thread milling cutters according to customer specifications.

The CNC programme is available free of charge.
Download on our website www.stock.de.



To the optimal CNC programme in five steps

1. **Specify the thread data**
   Select from all current thread standards
2. **Select the material**
   You are always referred to the optimal parameters
3. **Select the tool**
   Technical data, drawing, machining time and video simplify the selection
4. **Enter CNC data**
   Enter required milling strategy and parameters
5. **Receive CNC programme with code and data sheet**
   Programming data (Sinumerik, Haidenhain, Fanuc, Philips, Mazatrol or Hurco) are imported and automatically recognised

CNC Data Sheet

R. Stock AG
Lengeder Strasse 29-35
13407 Berlin, Germany
Phone: +49 30 40 90 3-33 30 0
Fax: +49 30 40 90 3-33 32 4
Mail: sales@stock.de
www.stock.de

Date 23.01.2018

Machining Task		Material
Thread Dimension	M10	Structural- and free cutting steels,
Length	16.00 mm	unalloyed tempered-/case hardened
Countersink W=90°	No	

Tool		Cutting Values			
Description	TM SP 2xD without chamfer	**Milling**			
Milling cutter diameter	d1 = 7.95 mm	**Vc**	90 m/min	**n**	3604 1/min
Programmed Radius	3.94 mm	**fz**	0.045 mm/tooth		
Order-No.	53830_10.000	**Vf**	486 mm/min	**Vm**	100 mm/min

NC-Options		Cycle Time	
Machine Control	Sinumerik [DIN]	**Total Time**	7.05 sec.
Cutting Path	Center path, incremental		
Milling Process	Conventional milling		
No. of passes	One cut		

Note CNC programme serves as a programming example and should be tested by simulation before use.

CNC Code

```
; Tool= TM SP 2xD without chamfer M10
; Material= P1
; Vc=90 m/min
; fz=0.045 mm/tooth
; Conventional milling
; One Cut
; Thread Type= Internal Right-Hand Thread
N10 M6 T1
N20 G90 G54 G00 X0.000 Y0.000
N30 Z2.000 S3604 M3 M8
N40 Z-14.050
N50 G91
N60 G42 G01 X0.000 Y3.975 F50 (F243)
N70 G02 X0.000 Y-8.975 I0.000 J-4.488 Z-0.225
N80 G02 X0.000 Y0.000 I0.000 J5.000 Z-1.500 F100 (F486)
N90 G02 X0.000 Y8.975 I0.000 J4.488 Z-0.225
N100 G40 G01 X0.000 Y-3.975
N110 G90
N120 G00 Z2.000 M9
N130 M30
```

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

TECHNICAL INFORMATION

Hard machining
Taps and drills

For difficult cases

With taps type HX and HCX STOCK offers special solutions for the machining of high-tensile materials. Their special hard coating adds high wear resistance for the high requirements of hard machining.

Application range HX

- Inconel
- Hastelloy
- Waspalloy
- Nickel based alloys

Application range HDX

- Titanium
- Titanium alloys

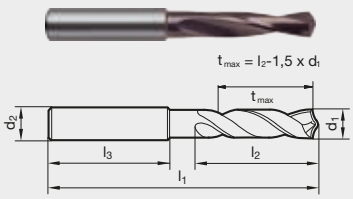
Application range HCX

- Tool steels
- Alloyed heat-treatable steels
- High speed steels
- Malleable cast iron
- Cast with vermicular graphite
- Cast with spheroidal graphite
- Bronze, hard
- Special materials, hard
- Ampco >21

The Stock drill for core holes in hard materials!

The Stock hard drill enables economically efficient and process reliable drilling in hardened steels at hardness levels of up to 62 HRC. Due to convex-shaped cutting edges the tool provides an extremely high stability and guarantees a perfect chip breaking. The flute profile has been adapted to hard machining and evacuates chips safely out of the hole. The Stock hard drill is equipped with a straight shank according to DIN 6535 HA and is available as a standard tool with diameters from 2.6 to 14.1 mm.

Catalogue no. 51146



H	~3xD	DIN 6537 K	VHM	Al-TiN	120°	m7	R	HA

P	M	K	N	S	H
○		○			●

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
2.600	6.000	62.000	20.000	36.000
3.000	6.000	62.000	20.000	36.000
3.400	6.000	62.000	20.000	36.000
4.000	6.000	66.000	24.000	36.000
4.300	6.000	66.000	24.000	36.000
5.000	6.000	66.000	28.000	36.000
5.100	6.000	66.000	28.000	36.000
5.600	6.000	66.000	28.000	36.000
6.000	6.000	66.000	28.000	36.000
6.900	8.000	79.000	34.000	36.000
7.100	8.000	79.000	41.000	36.000
8.000	8.000	79.000	41.000	36.000

d1 mm	d2 mm	l1 mm	l2 mm	l3 mm
8.600	10.000	89.000	47.000	40.000
9.100	10.000	89.000	47.000	40.000
10.000	10.000	89.000	47.000	40.000
10.400	12.000	102.000	55.000	45.000
10.600	12.000	102.000	55.000	45.000
11.100	12.000	102.000	55.000	45.000
12.000	12.000	102.000	55.000	45.000
14.100	16.000	115.000	65.000	48.000

Thread production

Synchronic and universal

Stock Synchro taps

CNC controls on modern machining centres have improved the production of threads with machine taps to the extent that spindle rotation and feed are generally synchronised. Conventional length compensation chucks are subsequently superfluous. It can, however, indeed be helpful to apply modern compensation chucks with slight axial movement for machine taps in synchronous applications. Especially for the production of blind hole threads they compensate possible errors. Thanks to accurate tool clamping with small concentricity deviations and synchronous guide the tool life is improved even with considerably higher cutting speeds compared to conventional taps.

Stock HSS-E-PM synchro machine taps with a suitably developed cutting edge geometry and TiCN-coating withstand the high loads resulting from the higher cutting speed and the reversal of the cutting direction. The type “Intensiv“ is provided with internal cooling in order to ensure a perfect chip evacuation in the direction of the shank as well as optimal cooling for the production of blind hole threads. Both types, “Intensiv” for blind hole threads and “Produktiv” for through hole threads, are geometrically designed so they are suitable for a wide range of materials, i.e. they are universally applicable.

Application range

Universal machining of a large material range with tensile strengths up to 1200 N/mm^2:

- nonferrous metals
- general steels
- stainless and acid resistant steels
- cast iron
- Titanium and Nickel alloys

The suitability for your special material should be tested by machining trials.

Advantages

- absolutely accurate threads
- no cutting errors
- no pre-expanding
- no pitch distorsion
- gentle machining
- optimal chip evacuation
- high cutting parameters
- long tool life

Tapping hole size diameter

Thread cutting tools

Std. ISO metric threads DIN 13

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

* M 1.1 to M 1.4 core diameter of int. thread 5H

Std. ISO metric fine threads DIN 13

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

UNC threads ASME B1.1

nom.-Ø Threads per inch	Tapping hole size Ø DIN 336 mm	Core diameter of int. thread 2B min. mm	Core diameter of int. thread 2B max. mm
No 1 - 64	**1.55**	1.425	1.580
No 2 - 56	**1.85**	1.694	1.872
No 3 - 48	**2.10**	1.941	2.146
No 4 - 40	**2.35**	2.157	2.385
No 5 - 40	**2.65**	2.487	2.698
No 6 - 32	**2.85**	2.642	2.896
No 8 - 32	**3.50**	3.302	3.531
No 10 - 24	**3.90**	3.683	3.937
No 12 - 24	**4.50**	4.343	4.597
1/4 - 20	**5.10**	4.978	5.258
5/16 - 18	**6.60**	6.401	6.731
3/8 - 16	**8.00**	7.798	8.153
7/16 - 14	**9.40**	9.144	9.550
1/2 - 13	**10.80**	10.592	11.024
9/16 - 12	**12.20**	11.989	12.446
5/8 - 11	**13.50**	13.386	13.868
3/4 - 10	**16.50**	16.307	16.840
7/8 - 9	**19.50**	19.177	19.761
1 - 8	**22.25**	21.971	22.606
1 1/8 - 7	**25.00**	24.638	25.349
1 1/4 - 7	**28.00**	27.813	28.524
1 3/8 - 6	**30.75**	30.353	31.115
1 1/2 - 6	**34.00**	33.528	34.290
1 3/4 - 5	**39.50**	38.938	39.802
2 - 4.5	**45.00**	44.679	45.593

The compatible HSS and solid carbide drills can be found in our catalogue. Catalogue available on request.

MJ threads DIN ISO 5855

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

* MJ 3 x 0.50 to MJ 5 x 0.80 core diameter of int. thread 6H

UNJC threads ISO 3161

nom.-Ø Threads per inch	Tapping hole size Ø mm	Core diameter of int. thread 3B min. mm	Core diameter of int. thread 3B max. mm
No 6 - 32	**2.85**	2.733	2.939
No 8 - 32	**3.55**	3.393	3.599
No 10 - 24	**4.00**	3.795	4.064
No 12 - 24	**4.60**	4.455	4.704
1/4 - 20	**5.30**	5.113	5.387
5/16 - 18	**6.75**	6.563	6.833
3/8 - 16	**8.20**	7.978	8.255
7/16 - 14	**9.60**	9.346	9.639
1/2 - 13	**11.00**	10.798	11.095
9/16 - 12	**12.40**	12.228	12.482
5/8 - 11	**13.80**	13.627	13.904

UNJF threads ISO 3161

nom.-Ø Threads per inch	Tapping hole size Ø mm	Core diameter of int. thread 3B min. mm	Core diameter of int. thread 3B max. mm
No 6 - 40	**3.00**	2.888	3.053
No 8 - 36	**3.60**	3.480	3.663
No 10 - 32	**4.20**	4.054	4.255
No 12 - 28	**4.75**	4.602	4.816
1/4 - 28	**5.60**	5.466	5.662
5/16 - 24	**7.00**	6.906	7.109
3/8 - 24	**8.60**	8.494	8.679
7/16 - 20	**10.00**	9.876	10.084
1/2 - 20	**11.60**	11.463	11.661
9/16 - 18	**13.00**	12.913	13.122
5/8 - 18	**14.60**	14.501	14.702

UNF threads ASME B1.1

nom.-Ø	Threads per inch	Tapping hole size Ø DIN 336 mm	Core diameter of int. thread 2B min. mm	Core diameter of int. thread 2B max. mm
No 1	72	**1.55**	1.473	1.610
No 2	64	**1.85**	1.755	1.910
No 3	56	**2.15**	2.024	2.197
No 4	48	**2.40**	2.271	2.459
No 5	44	**2.70**	2.550	2.741
No 6	40	**2.95**	2.819	3.023
No 8	36	**3.50**	3.404	3.607
No 10	32	**4.10**	3.962	4.166
No 12	28	**4.60**	4.496	4.724
1/4	28	**5.50**	5.359	5.588
5/16	24	**6.90**	6.782	7.036
3/8	24	**8.50**	8.382	8.636
7/16	20	**9.90**	9.728	10.033
1/2	20	**11.50**	11.328	11.608
9/16	18	**12.90**	12.751	13.081
5/8	18	**14.50**	14.351	14.681
3/4	16	**17.50**	17.323	17.678
7/8	14	**20.40**	20.269	20.650
1	12	**23.25**	23.114	23.571
1 1/8	12	**26.50**	26.289	26.746
1 1/4	12	**29.50**	29.464	29.921
1 3/8	12	**32.75**	32.639	33.096
1 1/2	12	**36.00**	35.814	36.271

BSW (Whitworth) threads BS84

nom.-Ø inch	Threads per inch	Tapping hole size Ø mm	Core diameter of int. thread min. mm	Core diameter of int. thread max. mm
W 1/16	60	**1.20**	1.045	1.230
W 3/32	48	**1.80**	1.704	1.912
W 1/8	40	**2.50**	2.362	2.591
W 5/32	32	**3.20**	2.952	3.214
W 3/16	24	**3.60**	3.407	3.745
W 7/32	24	**4.50**	4.201	4.539
W 1/4	20	**5.10**	4.724	5.156
W 5/16	18	**6.50**	6.130	6.590
W 3/8	16	**7.90**	7.492	7.987
W 7/16	14	**9.20**	8.789	9.330
W 1/2	12	**10.50**	9.989	10.591
W 9/16	12	**12.00**	11.577	12.179
W 5/8	11	**13.50**	12.918	13.558
W 3/4	10	**16.25**	15.797	16.483
W 7/8	9	**19.25**	18.611	19.353
W 1	8	**22.00**	21.334	22.147
W 1 1/8	7	**24.50**	23.928	24.832
W 1 1/4	7	**27.75**	27.103	28.007
W 1 3/8	6	**30.50**	29.504	30.528
W 1 1/2	6	**33.50**	32.679	33.703
W 1 5/8	5	**35.50**	34.769	35.963
W 1 3/4	5	**39.00**	37.944	39.138
W 2	4.5	**44.50**	43.571	44.877

(Whitworth) BSP threads (acc. to DIN-ISO 228-1)

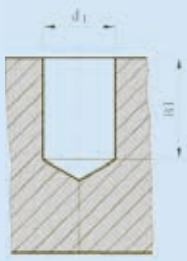
nom.-Ø inch	Threads per inch	Tapping hole size Ø DIN 336 mm	Core diameter of int. thread min. mm	Core diameter of int. thread max. mm
G 1/16	28	**6.80**	6.561	6.843
G 1/8	28	**8.80**	8.566	8.848
G 1/4	19	**11.80**	11.445	11.890
G 3/8	19	**15.25**	14.950	15.395
G 1/2	14	**19.00**	18.631	19.172
G 5/8	14	**21.00**	20.587	21.128
G 3/4	14	**24.50**	24.117	24.658
G 7/8	14	**28.25**	27.877	28.418
G 1	11	**30.75**	30.291	30.931
G 1 1/8	11	**35.50**	34.939	35.579
G 1 1/4	11	**39.50**	38.952	39.592
G 1 1/2	11	**45.25**	44.845	45.485
G 1 3/4	11	**51.00**	50.788	51.428
G 2	11	**57.00**	56.656	57.296

PG threads acc. to DIN 40430

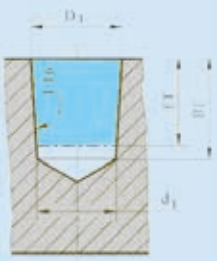
nom.-Ø	Threads per inch	Tapping hole size Ø mm	Core diameter of int. thread min. mm	Core diameter of int. thread max. mm
Pg 7	20	**11.40**	11.280	11.430
Pg 9	18	**14.00**	13.860	14.010
Pg 11	18	**17.30**	17.260	17.410
Pg 13.5	18	**19.00**	19.060	19.210
Pg 16	18	**21.30**	21.160	21.310
Pg 21	16	**26.90**	26.780	27.030
Pg 29	16	**35.50**	35.480	35.730
Pg 36	16	**45.50**	45.480	45.730
Pg 42	16	**52.50**	52.480	52.730
Pg 48	16	**57.80**	57.780	58.030

NPT ANSI B 2.1 American tapered pipe thread 1:16

Version A (to avoid if possible)



Version B



nom.-Ø	Threads per inch	Tapp. hole Ø cyl. (A) d_1	Core diameter conical (B) D_1	Cutting depth ET mm	Drill depth BT (min) mm
1/16	27	**6.15**	6.39	9.29	10.7
1/8	27	**8.40**	8.74	9.32	10.8
1/4	18	**11.10**	11.36	13.52	15.6
3/8	18	**14.30**	14.80	13.83	16.0
1/2	14	**17.90**	18.32	18.07	20.8
3/4	14	**23.30**	23.67	18.55	21.3
1	11.5	**29.00**	29.69	22.29	25.6
1 1/4	11.5	**37.70**	38.45	22.80	26.1
1 1/2	11.5	**43.70**	44.52	22.80	26.1
2	11.5	**55.60**	56.56	23.20	26.5
2 1/2	8	**66.30**	67.62	31.75	36.3
3	8	**82.30**	83.52	33.74	38.5

EG threads Metr./Metr. fine (EG M 14 x 1,25) for wire thread inserts DIN 8140

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

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

nom.-Ø	Threads per inch	Tapping hole size Ø mm	Core diameter of int. thread min. mm	Core diameter of int. thread max. mm
EG No 6	32	**3.80**	3.678	3.879
EG No 8	32	**4.40**	4.338	4.524
EG No 10	24	**5.20**	5.055	5.283
EG No 12	24	**5.80**	5.715	5.944
EG 1/4	20	**6.70**	6.624	6.868
EG 5/16	18	**8.40**	8.242	8.489
EG 3/8	16	**10.00**	9.868	10.127
EG 7/16	14	**11.60**	11.506	11.783
EG 1/2	13	**13.30**	13.122	13.393
EG 9/16	12	**14.90**	14.747	15.032
EG 5/8	11	**16.50**	16.375	16.673

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

nom.-Ø	Threads per inch	Tapping hole size Ø mm	Core diameter of int. thread min. mm	Core diameter of int. thread max. mm
EG No 6	40	**3.70**	3.644	3.818
EG No 8	36	**4.40**	4.321	4.498
EG No 10	32	**5.10**	4.999	5.184
EG No 12	28	**5.70**	5.682	5.809
EG 1/4	28	**6.60**	6.546	6.721
EG 5/16	24	**8.25**	8.166	8.352
EG 3/8	24	**9.80**	9.754	9.931
EG 7/16	20	**11.50**	11.389	11.585
EG 1/2	20	**13.10**	12.974	13.172
EG 9/16	18	**14.70**	14.592	14.798
EG 5/8	18	**16.25**	16.180	16.386

Recommended hole size diameter

Cold forming taps

Std. ISO metric threads DIN 13

nom.-Ø mm	Pitch P	Tapp. hole size Ø mm	Tapping hole size Ø min. mm	Tapping hole size Ø max. mm	Core-Ø of int. thread 7H* min. mm	Core-Ø of int. thread 7H* max. mm
M1	0.25	**0.90**	0.89	0.92	0.729	0.819
M1.2	0.25	**1.10**	1.09	1.12	0.929	1.019
M1.4	0.30	**1.28**	1.27	1.30	1.075	1.181
M1.6	0.35	**1.46**	1.45	1.48	1.221	1.346
M1.7	0.35	**1.56**	1.55	1.58	1.321	1.446
M1.8	0.35	**1.66**	1.65	1.68	1.421	1.546
M 2	0.40	**1.85**	1.84	1.88	1.567	1.679
M 2.2	0.45	**2.00**	2.01	2.05	1.713	1.838
M 2.5	0.45	**2.30**	2.28	2.32	2.013	2.138
M 3	0.50	**2.80**	2.78	2.85	2.459	2.639
M 3.5	0.60	**3.25**	3.23	3.30	2.850	3.050
M 4	0.70	**3.70**	3.68	3.76	3.242	3.466
M 4.5	0.75	**4.20**				
M 5	0.80	**4.65**	4.62	4.71	4.134	4.384
M 6	1.00	**5.55**	5.52	5.62	4.917	5.217
M 7	1.00	**6.55**	6.52	6.62	5.917	6.217
M 8	1.25	**7.40**	7.36	7.47	6.647	6.982
M 9	1.25	**8.40**	8.36	8.47	7.647	7.982
M 10	1.50	**9.30**	9.26	9.38	8.376	8.751
M 11	1.50	**10.30**	10.26	10.38	9.376	9.751
M 12	1.75	**11.20**	11.15	11.29	10.106	10.531
M 14	2.00	**13.10**	13.05	13.20	11.835	12.310
M 16	2.00	**15.10**	15.05	15.20	13.835	14.310
M 18	2.50	**16.90**	16.83	17.02	15.294	15.854
M 20	2.50	**18.90**	18.83	19.02	17.294	17.854
M 22	2.50	**20.90**	20.83	21.02	19.294	19.854
M 24	3.00	**22.70**	22.62	22.80	20.752	21.382
M 27	3.00	**25.70**	25.62	25.80	23.752	24.382
M 30	3.50	**28.50**	28.40	28.60	26.211	26.921
M 33	3.50	**31.50**	31.40	31.60	29.211	29.921
M 36	4.00	**34.30**	34.17	34.40	31.670	32.420
M 39	4.00	**37.30**	37.17	37.40	34.670	35.420
M 42	4.50	**40.10**	39.95	40.20	37.129	37.979

* M 2 to M 2.5 core-Ø of int. thread 6H

Std. ISO metric fine threads DIN 13

nom.-Ø mm	x Pitch P	Tapp. hole size Ø mm	Tapping hole size Ø min. mm	Tapping hole size Ø max. mm	Core-Ø of int. thread 7H* min. mm	Core-Ø of int. thread 7H* max. mm
M 2.5	x 0.35	**2.35**	2.35	2.38	2.121	2.221
M 3	x 0.35	**2.85**	2.85	2.88	2.621	2.721
M 4	x 0.35	**3.85**	3.85	3.88	3.621	3.721
M 4	x 0.50	**3.80**	3.78	3.83	3.459	3.639
M 5	x 0.50	**4.80**	4.78	4.83	4.459	4.639
M 5.5	x 0.50	**5.30**	5.28	5.33	4.959	5.139
M 6	x 0.75	**5.65**	5.62	5.70	5.188	5.424
M 7	x 0.75	**6.65**	6.62	6.70	6.188	6.424
M 8	x 0.75	**7.65**	7.62	7.70	7.188	7.424
M 8	x 1.00	**7.55**	7.52	7.62	6.917	7.217
M 9	x 0.75	**8.65**	8.62	8.70	8.188	8.424
M 9	x 1.00	**8.55**	8.52	8.62	7.917	8.217
M 10	x 0.75	**9.65**	9.62	9.70	9.188	9.424
M 10	x 1.00	**9.55**	9.52	9.62	8.917	9.217
M 10	x 1.25	**9.40**	9.36	9.47	8.647	8.982
M 11	x 0.75	**10.65**	10.62	10.70	10.188	10.424
M 11	x 1.00	**10.55**	10.52	10.62	9.917	10.217
M 12	x 1.00	**11.55**	11.52	11.62	10.917	11.217
M 12	x 1.25	**11.40**	11.36	11.47	10.647	10.982
M 12	x 1.50	**11.30**	11.26	11.38	10.376	10.751
M 14	x 1.00	**13.55**	13.52	13.62	12.917	13.217
M 14	x 1.25	**13.40**	13.36	13.47	12.647	12.982
M 14	x 1.50	**13.30**	13.26	13.38	12.376	12.751
M 15	x 1.00	**14.55**	14.52	14.62	13.917	14.217
M 15	x 1.50	**14.30**	14.26	14.38	13.376	13.751
M 16	x 1.00	**15.55**	15.52	15.62	14.917	15.217
M 16	x 1.50	**15.30**	15.26	15.38	14.376	14.751

* M 2.5 x 0.35 to M 4 x 0.35 core-Ø of int. thread 6H

nom.-Ø mm	x Pitch P	Tapp. hole size Ø mm	Tapping hole size Ø min. mm	Tapping hole size Ø max. mm	Core-Ø of int. thread 7H* min. mm	Core-Ø of int. thread 7H* max. mm
M 17	x 1.00	**16.55**	16.52	16.62	15.917	16.217
M 17	x 1.50	**16.30**	16.26	16.38	15.376	15.751
M 18	x 1.00	**17.55**	17.52	17.62	16.917	17.217
M 18	x 1.50	**17.30**	17.26	17.38	16.376	16.751
M 18	x 2.00	**17.10**	17.05	17.20	15.835	16.310
M 20	x 1.00	**19.55**	19.52	19.62	18.917	19.217
M 20	x 1.50	**19.30**	19.26	19.38	18.376	19.751
M 24	x 1.00	**23.55**	23.52	23.62	22.917	23.217
M 24	x 1.50	**23.30**	23.26	23.38	22.376	22.751
M 24	x 2.00	**23.10**	23.05	23.20	21.835	22.310
M 27	x 1.50	**26.30**	26.26	26.38	25.376	25.751
M 30	x 1.50	**29.30**	29.26	29.38	28.376	28.751
M 33	x 1.50	**32.30**	32.26	32.38	31.376	31.751
M 36	x 1.50	**35.30**	35.26	35.38	34.376	34.751
M 39	x 1.50	**38.30**	38.26	38.38	37.376	37.751
M 42	x 1.50	**41.30**	41.26	41.38	42.376	42.751

Tapping hole size diameter tolerance zone for thread forming (to DIN 13, section 50)
Due to the tensile strength it is not necessary to adhere to the tapping hole size diameter tolerance class 6H; tolerance class 7H satisfies the requirement that the flank coverage of external and internal threads should not fall below 0.32 x P. In addition, formed threads generally possess a higher tensile strength in comparison to cut threads thanks to an uninterrupted grain flow and subsequent work hardening.

UNC threads ASME B1.1

nom.-Ø	Threads per inch	Tapp. hole size Ø mm	Tapping hole size Ø min. mm	Tapping hole size Ø max. mm	Core-Ø of int. thread 2B min. mm	Core-Ø of int. thread 2B max. mm
No 1	- 64	**1.68**	1.67	1.70	1.425	1.580
No 2	- 56	**1.98**	1.97	2.01	1.694	1.872
No 3	- 48	**2.28**	2.27	2.32	1.941	2.146
No 4	- 40	**2.55**	2.54	2.59	2.157	2.385
No 5	- 40	**2.90**	2.89	2.94	2.487	2.698
No 6	- 32	**3.15**	3.14	3.19	2.642	2.896
No 8	- 32	**3.80**	3.78	3.82	3.302	3.531
No 10	- 24	**4.35**	4.33	4.39	3.683	3.937
No 12	- 24	**5.00**	4.97	5.03	4.343	4.597
1/4	- 20	**5.75**	5.72	5.80	4.978	5.258
5/16	- 18	**7.30**	7.26	7.37	6.401	6.731
3/8	- 16	**8.80**	8.77	8.88	7.798	8.153
7/16	- 14	**10.30**	10.27	10.37	9.144	9.550
1/2	- 13	**11.80**	11.77	11.88	10.592	11.024
9/16	- 12	**13.30**	13.28	13.39	11.989	12.446
5/8	- 11	**14.80**	14.78	14.90	13.386	13.868
3/4	- 10	**17.90**	17.85	17.97	16.307	16.840
7/8	- 9	**21.00**	20.95	21.10	19.177	19.761
1	- 8	**24.00**	23.95	24.12	21.971	22.606

UNF threads ASME B1.1

nom.-Ø	Threads per inch	Tapp. hole size Ø mm	Tapping hole size Ø min. mm	Tapping hole size Ø max. mm	Core-Ø of int. thread 2B min. mm	Core-Ø of int. thread 2B max. mm
No 1	- 72	**1.70**	1.69	1.72	1.473	1.610
No 2	- 64	**2.00**	1.99	2.03	1.755	1.910
No 3	- 56	**2.30**	2.29	2.34	2.024	2.197
No 4	- 48	**2.60**	2.59	2.63	2.271	2.459
No 5	- 44	**2.90**	2.89	2.93	2.550	2.741
No 6	- 40	**3.20**	3.19	3.24	2.819	3.023
No 8	- 36	**3.85**	3.83	3.88	3.404	3.607
No 10	- 32	**4.45**	3.43	4.49	3.962	4.166
No 12	- 28	**5.10**	5.07	5.13	4.496	4.724
1/4	- 28	**5.95**	5.92	5.99	5.359	5.588
5/16	- 24	**7.45**	7.42	7.50	6.782	7.036
3/8	- 24	**9.05**	9.02	9.10	8.838	8.636
7/16	- 20	**10.55**	10.48	10.58	9.728	10.033
1/2	- 20	**12.10**	12.08	12.18	11.328	11.608
9/16	- 18	**13.65**	13.61	13.72	12.751	13.081
5/8	- 18	**15.25**	15.21	15.32	14.351	14.681
3/4	- 16	**18.35**	15.30	18.41	17.323	17.678
7/8	- 14	**21.40**	21.35	21.49	20.269	20.650
1	- 12	**24.45**	24.40	24.54	23.114	23.571

(Whitworth-) BSP threads DIN EN ISO 228-1

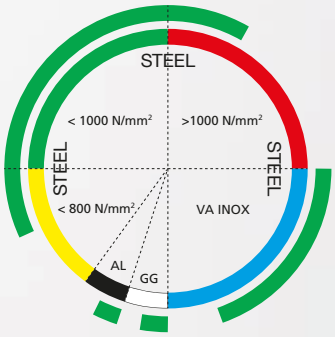
nom.-Ø inch	Threads per inch	Tapp. hole size Ø mm	Tapping hole size Ø min. mm	Tapping hole size Ø max. mm	Core-Ø of int. thread min. mm	Core-Ø of int. thread max. mm
G 1/16	28	**7.30**	7.28	7.35	6.561	6.843
G 1/8	28	**9.30**	9.28	9.35	8.566	8.848
G 1/4	19	**12.50**	12.48	12.55	11.445	11.890
G 3/8	19	**16.00**	15.98	16.05	14.950	15.395
G 1/2	14	**20.00**	19.98	20.12	18.631	19.172
G 5/8	14	**22.00**	21.98	22.12	20.587	21.128
G 3/4	14	**25.50**	25.48	25.62	24.117	24.658
G 7/8	14	**29.25**	29.23	29.37	27.877	28.418
G 1	11	**32.00**	31.98	32.15	30.291	30.931
G 1 1/4	11	**40.75**	40.70	40.85	38.952	39.592

Taps
Produktiv N-X
Intensiv N-X

- steels up to 1300 N/mm²
- acid and heat resistant steels
- non-ferrous metals
- cast materials
- thread types: metric, metric fine, G (BSP)

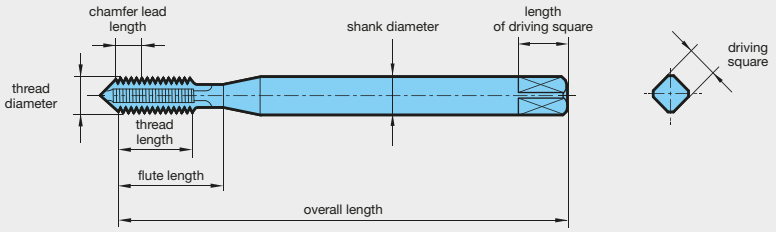
An all-rounder for the production of internal threads with an extremely wide range of application. For the machining of carbon, case-hardening, heat treatable, stainless and acid-resistant steels as well as cast materials and diverse non-ferrous metals in a tensile strength range from < 600 N/mm² to 1300 N/mm² with efficient chip evacuation, long tool life and high dimensional accuracy for the threads produced.

The innovative cutting edge geometry in combination with the controlled application of a wear-resistant TiAlN based coating and compliance with internal thread tolerances provides high quality threads of the correct size. The production of threads to manufacturing tolerance 6HX is achieved with far more economic efficiency thanks to the increased performance and for even wider universal applications and complete process reliability.

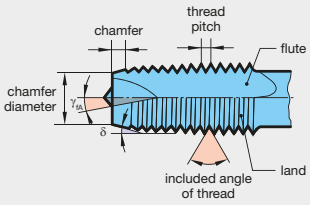


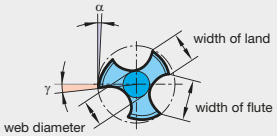
Application range

Definitions and angles, centres and flute forms to DIN EN 25967



δ = try square
γ_{fA} = spiral point angle
α = clearance angle
γ = rake angle





Flute forms

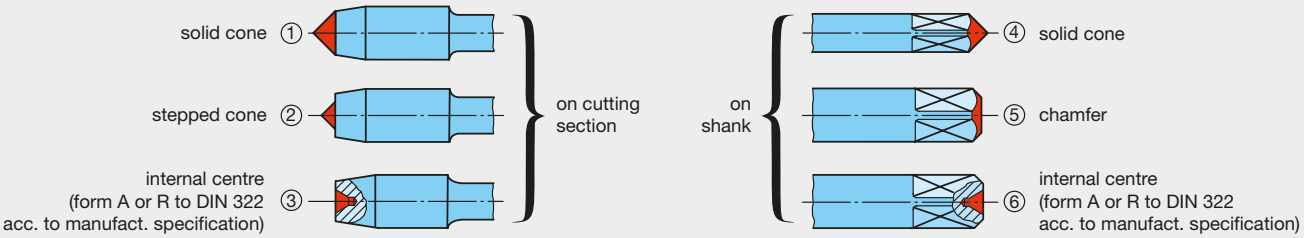

straight fluted, form C **without spiral point**


helix angle **15°**


straight fluted, form B **with spiral point**


helix angle **40°**

Types of centres (standard, to DIN 2197/DIN 2175)



	Centre on cutting section		
Thread diameter range mm	with chamfer forms A, C, D, E	with chamfer form B	Centre on shank
≤ 4.2	①	①	④ ⑤ ⑥
> 4.2 … 5.6	① ②	①	④ ⑤ ⑥
> 5.6 … 10.0	① ② ③	① ② ③	④ ⑤ ⑥
> 10.0	③	③	⑥

Coolant duct geometries


axial coolant supply with axial coolant duct exit


axial coolant supply with radial coolant duct exit in the flutes at the chamfer

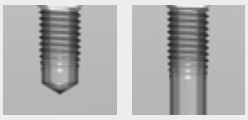
Chamfer forms
Selection and application

When cutting internal threads, all the machining is carried out by the cutting teeth of the chamfer. Therefore, a decision on the best type of chamfer form has to be carefully made as both tool life and quality of thread are thereby greatly affected.

Generally speaking, the form and length of chamfer depend on the type of hole to be tapped. The tapping of through holes does not normally give rise to any difficulties whereas the production of blind holes can create certain problems associated with the need to evacuate swarf in the reverse direction to the feed, i.e. up to the flutes of the tap and then cut off such swarf when the tap is reversed out of the hole.

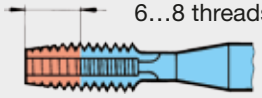
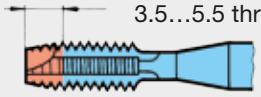
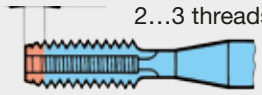
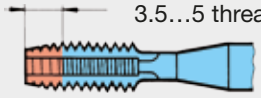
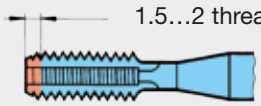
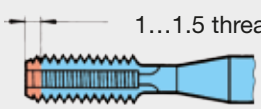
The length of chamfer is determined by taking into account various conflicting factors. To avoid overloading, premature bluntness and oversize threads the number of chamfer cutting threads must not be kept too low. A too long chamfer lead, however, increases the torque and thus the danger of breakage. The spiral point with form B ensures a chip removal always in the direction of feed.

Through hole



Blind hole

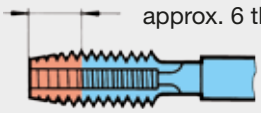
Chamfer forms to DIN 2197

Form A	 6…8 threads	long, 6 - 8 threads for short through holes
Form B	 3.5…5.5 threads	medium, 3.5 - 5.5 threads,with spiral point, for all through holes and deep tapping holes in medium and long-chipping materials
Form C	 2…3 threads	short, 2 - 3 threads for blind holes and generally for aluminium, grey cast iron and brass
Form D	 3.5…5 threads	medium, 3.5 - 5 threads for short through holes
Form E	 1.5…2 threads	extremely short, 1.5 - 2 threads, for blind holes with little run-out depth
Form F	 1…1.5 threads	extremely short, 1 - 1.5 threads, for blind holes with little run-out depth. Whenever possible, do not use.

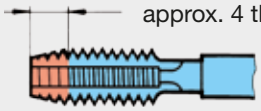
Chamfer forms
Selection and application

Chamfer lead length for sets of 3 taps

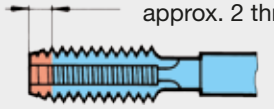
Form A
first tap



Form D
second tap

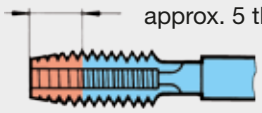


Form C
bottoming tap

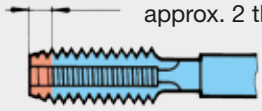


Chamfer lead length for sets of 2 taps

Form D
first tap



Form C
bottoming tap



Application recommendations

While in the first instance, the type of tapped hole required determines the chamfer, generally the tap geometry - i.e. form, number and direction of flutes, cutting angle, etc. - depend on the material to be machined and on the application. Basically, taps up to M16 for tapping ISO metric threads or for the engineering industry in general, have 3 flutes, and above this size 4 or more flutes.

Taps with left-hand flutes and taps with spiral points remove the chips in the cutting direction or direction of feed and are therefore especially suitable for tapping through holes. Taps with straight flutes and long chamfer lead (form D) also give good results.

As far as blind holes are concerned we recommend taps with right-hand spiral flutes or straight fluted taps with a short chamfer lead length. Tools with right-hand spiral flutes have the chip flow in the backward direction, i.e. up the flutes. The chamfer lead length is designed in such a way so that during the return movement chips do not jam and are reliably sheared off.

The tapping of aluminium, grey cast iron and brass requires taps with a short chamfer lead length, regardless of whether through or blind holes are required. In these materials a long chamfer lead length would act as a core drill with chip breaker grooves and would only drill the tapping size hole to the major diameter instead of cutting a thread.

Straight fluted taps without spiral point are general purpose tools and have the disadvantage of not showing optimum results in particular materials. It's well worth the effort to take the trouble of ascertaining the most suitable tool for any given metal-cutting task.


Straight fluted tap with spiral point


Left-hand spiral fluted tap


Straight fluted tap with long chamfer lead


Right-hand spiral fluted tap


Straight fluted tap with short chamfer lead

Questionnaire
Special solutions

Quantity _____ **Required number of threads** _____

Material

Material to be cut _____

Tensile strength / hardness _____ N/mm² HRC

Workpiece

Thread length _____ mm

Nom. thread size _____
f.ex. M18x0.5 ISO3/6H

Tool material

☐ Solid carbide ☐ HSS-E-PM ☐ HSS-E

Coolant

☐ internal ☐ external

☐ similar to standard item

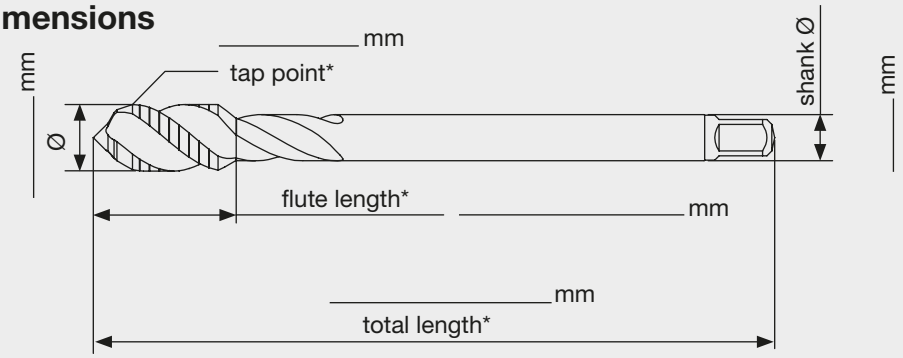
_____

Shank

☐ DIN 371 reinforced shank

☐ DIN 374 / DIN 376 reduced shank

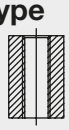
Dimensions

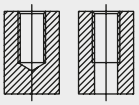


Special feature _____

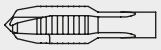
*(deviation from standard)

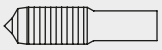
Hole type

☐  Through hole

☐  Blind hole

Threading process

☐  Threading

☐  Thread forming

Coating

☐ bright ☐ steam tempered ☐ TiN ☐ TiCN ☐ TiAlN ☐ AlCrN

Contact

Company _____ Company stamp

Contact person _____

Telephone/Fax _____ Date _____

Mail _____ Signature _____

Troubleshooting with new taps

Problem	Possible causes	Solution
1. Thread surface doesn‘t meet requirements 	Cutting edge geometry not suitable for the application	Apply “correct” tap for the material to be machined
	Cutting speed too high	Reduce cutting speed, optimise lubrication
	Insufficient coolant (concentration and supply)	Ensure suitable coolant and sufficient volume
	Chip congestion	Apply suitable tap type
	Tapping size hole too small	Observe tapping size hole diameter specifications to DIN 336 or respective standards. Observe table for fluteless taps
	With tough, hard materials loading on tool too much or pitch too steep	Apply hand tap sets
	Built-up edge	Apply coated tap
	Cold welding	Improve coolant supply
2. Tool life insufficient	Surface hardening of tappinge size hole	Check drill (cutting edge) for wear Heat or surface treatment following thread production
	Reasons listed under: “thread surface not according to requirements“	Reasons listed under: thread surface “not according to requirements“
	Chip congestion	Apply correct tap
3. Tool breakage during advance or return 	Tapping size hole too small	Observe tapping size hole dia. acc. to DIN 336 or respective standards
	Teeth of chamfer lead overloaded	Longer chamfer lead (blind or through hole) Increase no. of teeth of chamfer lead by increasing no. of flutes Apply tap sets
	Tap hits bottom of tapping size hole	Check hole depth Apply tension/compression tap chuck
	Lack of or incorrect chamfer of tapping size hole postional or angle error of tapping size hole	Correct chamfer angle of tapping size hole Ensure correct tool clamping Apply floating tap holder Check core drill
	Tool hardness not suitable for the application Cutting edge geometry not suitable for the application	Apply suitable tap for the individual application

Troubleshooting with reground taps

Problem	Possible causes	Solution
1. Thread produced is too large	Burrs	Remove burrs
	Cutting edge geometry (chamfer lead, rake-, chamfer-, spiral point angle) not retained	Observe technical specifications when regrinding Observe regrinding instruction
2. Thread produced is too small	Worn section has not been reground correctly	Regrind again or apply new tool Observe max. regrinding limits
	Tap too small due to no. of regrinds	Max. regrinding limit reached apply new tap
3. Thread produced not according to requirements	Burrs	Remove burrs
	Cutting edge geometry (chamfer lead, rake-, chamfer-,spiral point angle) not retained	Observe technical specifications when regrinding Observe regrinding instruction
	Peak-to-valley height of the reground tap too large	Regrind again or apply new tool Observe max. regrinding limits
	Cold welding at the flanks	Remove cold welding marks
4. Tool life insufficient	Cutting edge geometry (chamfer lead, rake-, chamfer-, spiral point angle) not retained	Check quality of grinding wheel Check coolant supply
	Loss of tap hardness due to heat development during the regrinding process	Check quality of grinding wheel Check coolant supply
	Loss of coating	Recoat Check coating of the material to be machined

Notes

Notes

Threading tools

Our Programme

Products

Twist Drills
Taps
Milling Cutters
Reamers
Countersinks & -bores
Chamfering Tools
Special HSS and Carbide Tools
(according to your specification or Stock solution)
Tool holders

Services

Regrinding
Modifications
Recoating
Paid labour coating
Coating removal
Intelligent Tool Depot Systems
Technical assistance

Your local contact:

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