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THREADING

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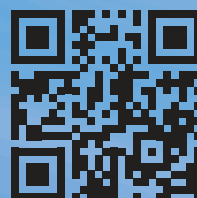
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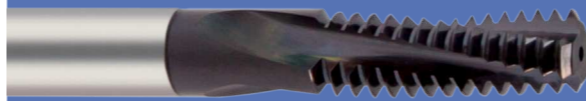
Catalogue No. TT16/1

Material Group Examples

Steel	11 Magnetic soft steels	12 Structural steels	13 Plain carbon steels	14 Alloy steels
P	EN1 EN2 OSOA12 230Mo7	EN3A, 4, 5, 6, 7, 8 060A35 040A10 EN32 210M15	EN9, 10 EN43 070M20 060A62 080M46	EN16, 17, 19 BO1 BO2 D2 D3
Hardened Steel	15 Alloy/Tempered steels	16 Hardened steels		
H	S95 S98, S99 BH11 BH13 830M31	>38 HRc Hardox400 Hardox500 P20		
Stainless Steel	21 Free machining	22 Austenitic	23 Martensitic/Ferritic	
M	EN56, 58 303S21 304S15 316S 321S17	EN58J 420S37 431S29	Duplex Super Duplex 17-4 PH S130	
Cast Iron	31 Grey cast iron soft	32 Grey cast iron hard	33 Nodular graphite	34 Nodular graphite
K	GG10 GG20 GG30 GG40	GG25 GG35 GF150	GGG40 GGG50 SG Iron	GGG70 GGG80 Meehanite
Titanium	41 Titanium unalloyed	42 Titanium alloys	43 Titanium alloys	
S	Pure Titanium TA1 - 9 Ti99.0	Ti6Al4V Ti6Al2Sn4Zr2Mo Ti4Al4Mo2Sn0.5Si	Ti10Al2Fe3Al Ti5Al5V5Mo3Cr Ti7Al4Mo Ti3Al8V6Cr4Zr4Mo Ti6Al6V6Sn Ti15V3 Cr3Sn3Al	
Nickel	51 Nickel unalloyed	52 Heat resisting alloys	53 Heat resisting alloys	
S	NA11 NA12 Nickel 200	Nimonic 75 Hastelloy C Inconel 601, 617, 625 Incoloy 800, 825 Monel 400	Nimonic 80 Rene 41 Inconel 718, 750-X Incoloy 925 Monel K-500	
Copper	61 Copper unalloyed	62 Short chip alloys	63 Long chip alloys	64 Cu - Al - Fe alloys
N	Commercially pure C101	CZ120 PB104 G-CuSn5ZnPb	CZ106 CZ108 CuZn37	Ampco18 Ampco20 Ampco26
Aluminium	71 Aluminium unalloyed	72 Aluminium, Si <0.5%	73 Aluminium, Si 0.5-10%	74 Aluminium, Si >10%
N	Al99.5H Al99.9 Al99.9Mg0.5	AlMn1 AlMn1Mg0.5 LM5, 10, 12 6061	HE9, 30 LM2, 4, 16, 18, 21-27 6082 6063	G-AlSi10Mg G-AlSi12 G-MgAl6 LM6,12, 13, 20, 28-30
Synthetics	81 Thermoplastics	82 Thermosetting plastics	83 Reinforced plastics	
O	Nylon Acetal	Tufnol	CFRP, GFRP Circuit Board Kevlar	


► For full material group tables, refer to pages 140 - 145






THREAD MILLS

P.4-29




APPLICATION TAPS

P.30-89




HAND & ISO TAPS

P.90-107



DIES & DIENUTS

P.108-123



ACCESSORIES

P.124-127

TECHNICAL DATA

P.129-145

SUPERIOR PERFORMANCE



THREAD MILL DRILL & CHAMFER



THREAD MILLS



IDEAL FOR MATERIAL GROUPS



THREAD MILL THROUGH COOLANT DRILL & CHAMFER, METRIC

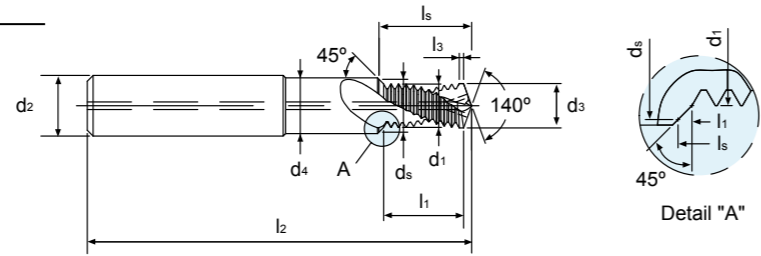


MG TIALN 60°



Series No. 198323

▶ cutting conditions : p.28



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 2xD
90° countersink
140° drill point

Nominal Dia.	Pitch P	Cutter Dia. d ₁	Drill Dia. d ₃	Thread Length l ₂	Eff. Length l ₃	Eff. Dia. d ₅	Max c'sink d ₄	Shank Dia. d ₂	Drill Length l ₃	O/all Length l ₁	EUROPA CODE
M6	1	4.75	5	13	14.68	6.3	6.6	8	1	62	1983230600
M8	1.25	6.35	6.75	16.27	18.48	8.3	9	10	1.25	74	1983230800
M10	1.5	7.95	8.5	21.05	23.77	10.3	11	12	1.5	79	1983231000
M12	1.75	9.95	10.25	24.21	27.25	12.3	13.5	14	1.5	89	1983231200
M14	2	11.2	12	29.58	33.32	14.3	15.5	16	1.5	102	1983231400

●: Excellent ○: Good

P		H		M		K		S		N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
					●	●								●	●
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
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THREAD MILL THROUGH COOLANT CHAMFER, NPT

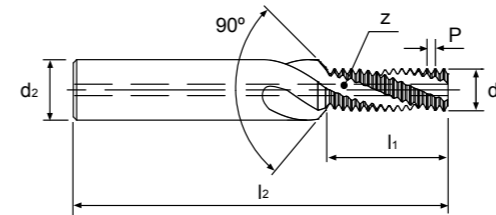


MG TIALN 60°



Series No. 196323

▶ cutting conditions : p.29



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 9xP

Nominal Dia.	TPI P	Cutter Dia. d ₁	O/all Length l ₁	Thread Length l ₂	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
1/16	27	5.9	64	8.9	10	3	1963230040
1/8	27	7.8	70	8.9	12	4	1963230080
1/4	18	10.05	81	13.4	16	4	1963230160
3/8	18	13.45	81	13.4	18	4	1963230240

●: Excellent ○: Good

P		H		M		K		S		N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●	○	○	○	●	●	○	○	○	○	○	○	○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
●	●		○		●	●	○	○	○	●	●	●	●		

THREAD MILL THROUGH COOLANT CHAMFER, METRIC

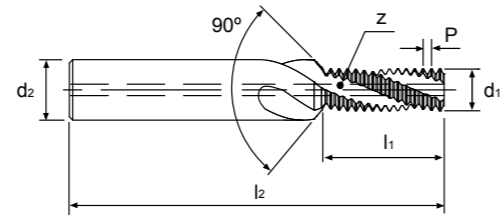


MG TIALN 60°



Series No. 192323

▶ cutting conditions : p.29



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 2xD

Nominal Dia.	Pitch P	Cutter Dia. d ₁	O/all Length l ₁	Thread Length l ₂	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
M6	1.0	4.8	62	12.4	8	3	1923230600
M8	1.25	6.5	74	16.8	10	3	1923230800
M10	1.5	8.2	80	20.15	12	4	1923231000
M12	1.75	9.9	90	25.25	14	4	1923231200
M14	2.0	11.6	100	28.85	16	4	1923231400
M16	2.0	13.6	102	32.85	18	4	1923231600

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●	○	○	○	●	●	○	○	○	○	○	○	○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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THREAD MILL THROUGH COOLANT CHAMFER, METRIC FINE

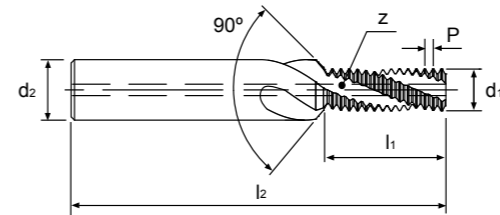


MG TIALN 60°



Series No. 193323

▶ cutting conditions : p.29



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 1.5xD

Nominal Dia.	Pitch P	Cutter Dia. d ₁	O/all Length l ₁	Thread Length l ₂	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
M8	1.0	6.7	74	12.4	10	3	1933230801
M10	1.25	8.3	80	15.9	12	4	1933231000
M10	1.0	8.7	80	15.4	12	4	1933231001
M12	1.5	10	90	18.65	14	4	1933231200
M12	1.25	10.3	80	18.3	14	4	1933231201
M12	1.0	10.7	90	18.4	14	4	1933231202
M14	1.5	12	100	21.65	16	4	1933231400
M16	1.5	14	102	24.65	18	5	1933231600

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●	○	○	○	●	●	○	○	○	○	○	○	○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●		○		●	●	○	○	○	●	●	●	●			

THREAD MILL THROUGH COOLANT CHAMFER, UNC

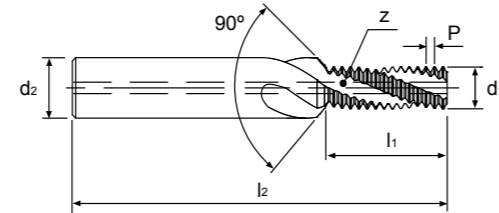


MG TIALN 60°



Series No. 194323

▶ cutting conditions : p.29



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 2xD

Nominal Dia.	TPI P	Cutter Dia. d ₁	O/all Length l ₁	Thread Length l ₂	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
1/4	20	4.8	62	13.3	8	3	1943230160
5/16	18	6.2	74	16.18	10	3	1943230200
3/8	16	7.6	80	19.8	12	4	1943230240
7/16	14	8.9	80	22.62	12	4	1943230280
1/2	13	10.3	90	26.32	14	4	1943230320
9/16	12	11.7	100	30.63	16	4	1943230360
5/8	11	13.1	102	33.41	18	4	1943230400
3/4	10	16	110	39.29	20	5	1943230480

●: Excellent ○: Good

P		H		M		K		S		N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●	○	○	○	●	●	○	○	○	○	○	○	○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
●	●		○		●	●	○	○	○	●	●	●	●		

THREAD MILL THROUGH COOLANT CHAMFER, UNF

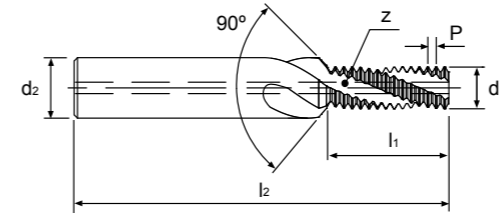


MG TIALN 60°



Series No. 195323

▶ cutting conditions : p.29



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 2xD

Nominal Dia.	TPI P	Cutter Dia. d ₁	O/all Length l ₁	Thread Length l ₂	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
1/4	28	5.1	62	13.21	8	3	1953230160
5/16	24	6.5	74	16.37	10	3	1953230200
3/8	24	8.1	80	19.54	12	4	1953230240
7/16	20	9.4	80	22.19	12	4	1953230280
1/2	20	11	90	26	14	4	1953230320
9/16	18	12.4	100	28.88	16	4	1953230360
5/8	18	14	102	33.12	18	5	1953230400
3/4	16	17	110	38.86	20	5	1953230480

●: Excellent ○: Good

P		H		M		K		S		N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●	○	○	○	●	●	○	○	○	○	○	○	○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
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THREAD MILL THROUGH COOLANT METRIC

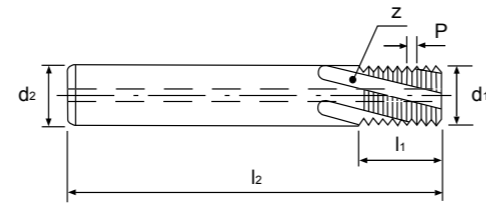


MG TIALN 60°



Series No. 190323

▶ cutting conditions : p.29



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 2xD

Nominal Dia.	Pitch P	Cutter Dia. d ₁	O/all Length l ₁	Thread Length l ₂	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
M6	1.0	4.5	57	13	6	3	1903230600
M8	1.25	6	65	17.5	6	3	1903230800
M10	1.5	7.5	72	21	8	4	1903231000
M12	1.75	9.5	80	26.25	10	4	1903231200
M14	2.0	10	83	30	10	4	1903231400
M16	2.0	12	92	34	12	4	1903231600
M20	2.5	16	105	42.5	16	5	1903232000

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●	○	○	○	●	●	○	○	○	○	○	○	○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●		○		●	●	○	○	○	●	●	●	●			

THREAD MILL THROUGH COOLANT METRIC FINE

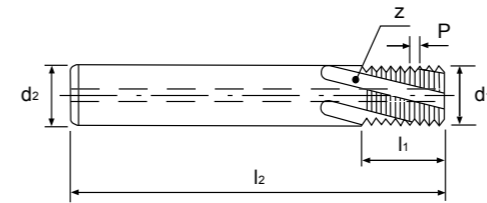


MG TIALN 60°



Series No. 191323

▶ cutting conditions : p.29



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 1.5xD

Nominal Dia.	Pitch P	Cutter Dia. d ₁	O/all Length l ₁	Thread Length l ₂	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
M8	1.0	6	57	13	6	3	1913230800
M8	0.75	6	57	12.75	6	3	1913230801
M10	1.0	8	63	16	8	4	1913231000
M12	1.5	9.5	72	19.5	10	4	1913231200
M12	1.25	9.5	72	18.75	10	4	1913231201
M12	1.0	9.5	72	19	10	4	1913231202
M14	1.5	10	83	22.5	10	4	1913231400
M14	1.0	10	83	22	10	4	1913231401
M16	1.5	12	83	25.5	12	4	1913231600
M16	1.0	12	83	25	12	4	1913231601
M18	1.5	14	92	28.5	14	5	1913231800
M18	1.0	14	92	28	14	5	1913231801
M20	1.5	16	92	31.5	16	5	1913232000
M20	1.0	16	92	31	16	5	1913232001

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●	○	○	○	●	●	○	○	○	○	○	○	○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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THREAD MILL THROUGH COOLANT BSP

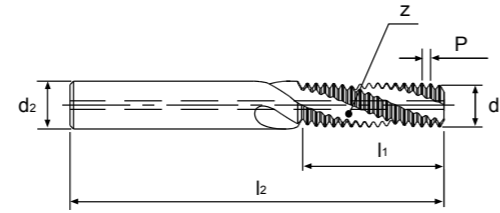


MG TIALN 55°



Series No. 183523

▶ cutting conditions : p.29



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 2xD

Nominal Dia.	TPI P	Cutter Dia. d ₁	O/all Length l ₁	Thread Length l ₂	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
1/16	28	5.9	65	16.3	6	3	1835230040
1/8	28	7.9	70	20.0	8	4	1835230080
1/4	19	9.9	80	26.7	10	4	1835230160
3/8	19	13.9	92	33.4	14	4	1835230240
1/2	14	15.9	104	43.5	16	5	1835230320
3/4	14	17.9	100	34.5	18	5	1835230480
1	11	19.9	100	34.6	20	5	1835230640

●: Excellent ○: Good

P		H		M		K		S		N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●	○	○	○	●	●	○	○	○	○	○	○	○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
●	●		○		●	●	○	○	○	●	●	●	●		

THREAD MILL SOLID NPT

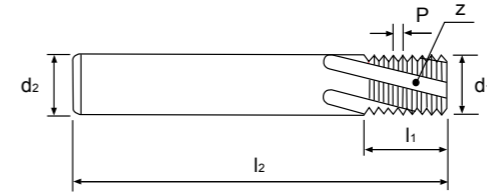


MG TIALN 60°



Series No. 183423

▶ cutting conditions : p.29



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 2xD

Nominal Dia.	TPI P	Cutter Dia. d ₁	O/all Length l ₁	Thread Length l ₂	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
1/8	27	7.6	60	9.41	8	4	1834230080
1/4-3/8	18	9.9	70	14.1	10	4	1834230160
1/2-3/4	14	15.9	100	19.96	16	4	1834230320
1-2.1/2	11.5	15.9	100	26.5	16	4	1834230640

●: Excellent ○: Good

P		H		M		K		S		N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●	○	○	○	●	●	○	○	○	○	○	○	○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
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THREAD MILL SOLID METRIC

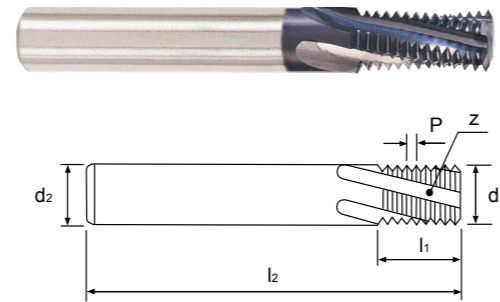


MG TIALN 60°

Series No. 180323

▶ cutting conditions : p.29

Shank to DIN6535HA
Spiral angle : 15°
Thread length : 2xD



Nominal Dia.	Pitch P	Cutter Dia. d ₁	O/all Length l ₁	Thread Length l ₂	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
M3	0.5	2.2	57	5	6	3	1803230300
M4	0.7	2.9	57	7	6	3	1803230400
M5	0.8	3.8	57	8	6	3	1803230500
M6	1.0	4.5	57	13	6	3	1803230600
M8	1.25	6.0	65	17.5	6	3	1803230800
M10	1.5	7.5	72	21	8	4	1803231000
M12	1.75	9.5	80	26.25	10	4	1803231200
M14	2.0	10.0	83	30	10	4	1803231400
M16	2.0	12.0	92	34	12	4	1803231600

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●	○	○	○	●	●	○	○	○	○	○	○	○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●		○		●	●	○	○	○	●	●	●	●			

THREAD MILL SOLID METRIC FINE

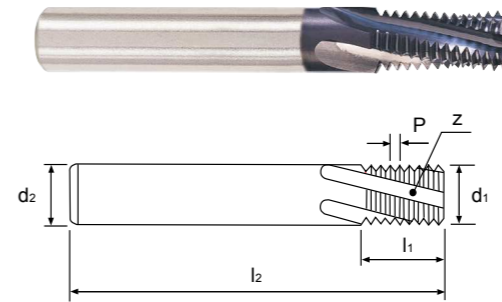


MG TIALN 60°

Series No. 181323

▶ cutting conditions : p.29

Shank to DIN6535HA
Spiral angle : 15°
Thread length : 1.5xD



Nominal Dia.	Pitch P	Cutter Dia. d ₁	O/all Length l ₁	Thread Length l ₂	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
M8	1.0	6.0	57	13	6	3	1813230800
M8	0.75	6.0	57	12.75	6	3	1813230801
M10	1.0	8.0	63	16	8	4	1813231000
M12	1.5	9.5	72	19.5	10	4	1813231200
M12	1.25	9.5	72	18.75	10	4	1813231201
M12	1.0	9.5	72	19	10	4	1813231202
M14	1.5	10.0	83	22.5	10	4	1813231400
M14	1.0	10.0	83	22	10	4	1813231401
M16	1.5	12.0	83	25.5	12	4	1813231600
M16	1.0	12.0	83	25	12	4	1813231601
M18	1.5	14.0	92	28.5	14	5	1813231800
M18	1.0	14.0	92	28	14	5	1813231801
M20	1.5	16.0	92	31.5	16	5	1813232000
M20	1.0	16.0	92	31	16	5	1813232001

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
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13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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THREAD MILL SOLID UNC

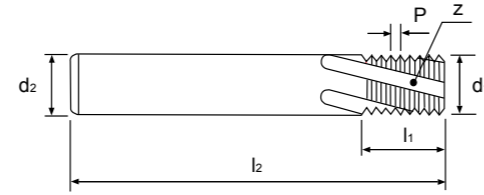


MG TIALN 60°



Series No. 182323

▶ cutting conditions : p.29



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 2xD

Nominal Dia.	TPI P	Cutter Dia. d ₁	O/all Length l ₂	Thread Length l ₁	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
1/4	20	4.5	57	14	6	3	1823230160
5/16	18	5.8	65	16.9	6	3	1823230200
3/8	16	7.0	72	20.6	8	4	1823230240
7/16	14	8.0	72	23.6	8	4	1823230280
1/2	13	9.5	80	27.4	10	4	1823230320
9/16	12	10.0	83	31.8	10	4	1823230360
5/8	11	12.0	92	34.6	12	4	1823230400
3/4	10	14.0	104	40.6	14	5	1823230480
7/8	9	15.9	100	39.51	16	4	1823230560
1"	8	19.2	120	38.1	20	4	1823230640
1.1/8	7	19.9	120	43.54	20	4	1823230720

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●	○	○	○	●	●	○	○	○	○	○	○	○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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THREAD MILL SOLID UNF

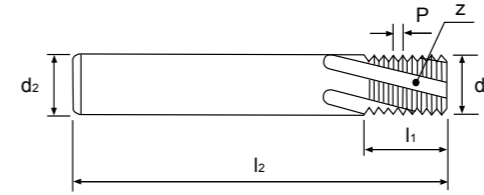


MG TIALN 60°



Series No. 183323

▶ cutting conditions : p.29



Shank to DIN6535HA
Spiral angle : 15°
Thread length : 2xD

Nominal Dia.	TPI P	Cutter Dia. d ₁	O/all Length l ₂	Thread Length l ₁	Shank Dia. d ₂	No. of Flutes z	EUROPA CODE
1/4	28	5.0	57	13.6	6	3	1833230160
5/16	24	6.0	65	16.9	6	3	1833230200
3/8	24	8.0	72	20.1	8	4	1833230240
7/16	20	8.0	72	24.1	8	4	1833230280
1/2	20	10.0	80	26.7	10	4	1833230320
9/16	18	12.0	83	29.6	12	4	1833230360
5/8	18	12.0	92	33.9	12	4	1833230400
3/4	16	14.0	104	39.7	14	5	1833230480
7/8	14	15.9	100	39.91	16	4	1833230560
1-1.1/2	12	15.9	100	38.1	16	4	1833230640

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●	○	○	○	●	●	○	○	○	○	○	○	○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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THREAD MILL MINIATURE METRIC

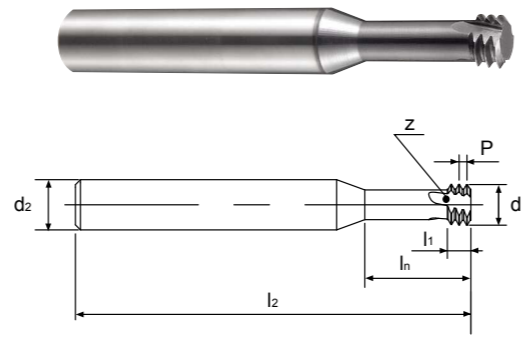


MG TIALN 60°

Series No. 186323

▶ cutting conditions : p.28

Shank to DIN6535HA
Spiral angle : 15°
Thread length : 3xP



Nominal Dia.	Pitch P	Cutter Dia. d ₁	O/all Length l ₂	Thread Length l ₁	Shank Dia. d ₂	Neck Length l _n	No. of Flutes z	EUROPA CODE
M1.6	0.35	1.18	30	1.05	3	3.4	3	1863230160
M2	0.4	1.52	57	1.2	6	4.2	3	1863230200
M2.2	0.45	1.66	57	1.35	6	4.6	3	1863230220
M2.5	0.45	1.96	57	1.35	6	5.3	3	1863230250
M3	0.5	2.4	57	1.5	6	6.3	3	1863230300
M4	0.7	3.16	57	2.1	6	8.4	3	1863230400
M5	0.8	4.04	57	2.4	6	10.5	3	1863230500
M6	1	4.8	57	3	6	12.6	3	1863230600
M8	1.25	6.5	63	3.75	8	16.8	3	1863230800
M10	1.5	8.2	73	4.5	10	21	3	1863231000
M12	1.75	9.9	73	5.25	10	25.2	3	1863231200

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●		○	○	●	●	○	○	○	○	○	○	○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●		○		●	●	○	○	○	●	●	●	●			

THREAD MILL MINIATURE METRIC <HRc62

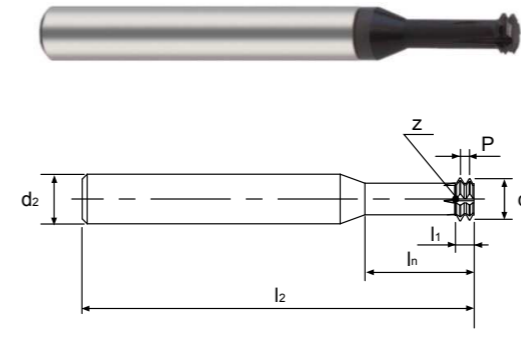


MG TIALN 60°

Series No. 188323

▶ cutting conditions : p.28

Shank to DIN6535HA
Straight flute
Thread length : 2xP
Left hand cut (M04)
For hard materials upto HRc62



Nominal Dia.	Pitch P	Cutter Dia. d ₁	O/all Length l ₂	Thread Length l ₁	Shank Dia. d ₂	Neck Length l _n	No. of Flutes z	EUROPA CODE
M2	0.4	1.52	57	0.8	6	4.2	4	1883230200
M2.2	0.45	1.66	57	0.9	6	4.6	4	1883230220
M2.5	0.45	1.96	57	0.9	6	5.3	4	1883230250
M3	0.5	2.4	57	1.0	6	6.3	4	1883230300
M4	0.7	3.16	57	1.4	6	8.4	4	1883230400
M5	0.8	4.04	57	1.6	6	10.5	4	1883230500
M6	1.0	4.8	57	2.0	6	12.6	5	1883230600
M8	1.25	6.5	63	2.5	8	16.8	5	1883230800
M10	1.5	8.2	73	3.0	10	21.0	6	1883231000
M12	1.75	9.9	73	3.5	10	25.2	6	1883231200

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
		●	○	○	●	●	○	○	○							
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●	●	○		●	●	●	●	●							

THREAD MILL MINIATURE UNC

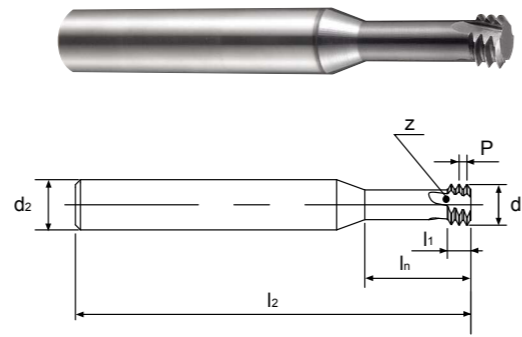


MG TIALN 60°

Series No. 187323

▶ cutting conditions : p.28

Shank to DIN6535HA
Spiral angle : 15°
Thread length : 3xP



Nominal Dia.	TPI P	Cutter Dia. d ₁	O/all Length l ₂	Thread Length l ₁	Shank Dia. d ₂	Neck Length l _n	No. of Flutes z	EUROPA CODE
No.1	64	1.38	57	1.19	6	3.9	3	1873230100
No.2	56	1.64	57	1.36	6	4.6	3	1873230200
No.4	40	2.08	57	1.91	6	6	3	1873230400
No.6	32	2.55	57	2.38	6	7.4	3	1873230600
No.8	32	3.21	57	2.38	6	8.7	3	1873230800
No.10	24	3.56	57	3.18	6	10.1	3	1873231000
No.12	24	4.22	57	3.18	6	11.5	3	1873231200
1/4	20	4.83	57	3.81	6	13.3	3	1873230160
5/16	18	6.24	63	4.23	8	16.7	3	1873239200
3/8	16	7.62	63	4.76	8	20	3	1873230240
7/16	14	8.94	73	5.44	10	23.3	3	1873230280

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●		○	○	●	●	○	○	○	○	○	○	○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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THREAD MILL MINIATURE UNC <HRC62

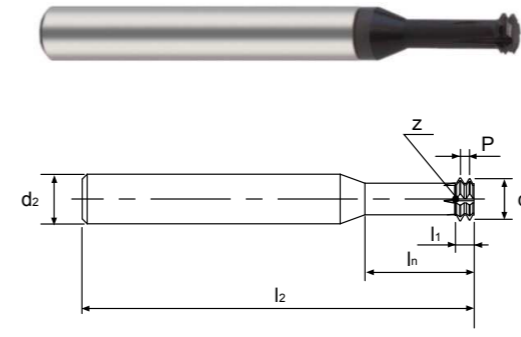


MG TIALN 60°

Series No. 189323

▶ cutting conditions : p.28

Shank to DIN6535HA
Straight flute
Thread length : 2xP
Left hand cut (M04)
For hard materials upto HRC62



Nominal Dia.	TPI P	Cutter Dia. d ₁	O/all Length l ₂	Thread Length l ₁	Shank Dia. d ₂	Neck Length l _n	No. of Flutes z	EUROPA CODE
No.2	56	1.64	57	0.91	6	4.6	4	1893230200
No.4	40	2.08	57	1.27	6	6.0	4	1893230400
No.6	32	2.55	57	1.59	6	7.4	4	1893230600
No.8	32	3.21	57	1.59	6	8.7	4	1893230800
No.10	24	3.56	57	2.12	6	10.1	4	1893231000
No.12	24	4.22	57	2.12	6	11.5	4	1893231200
1/4	20	4.83	57	2.54	6	13.3	5	1893230160
5/16	18	6.24	63	2.82	8	16.7	5	1893239200
3/8	16	7.62	63	3.18	8	20.0	6	1893230240
7/16	14	8.94	73	3.63	10	23.3	6	1893230280

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
		●	○	○	●	●	○	○	○							
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●	●	○		●	●	●	●	●							



THREAD MILLS CUTTING DATA

THREAD MILL CUTTING CONDITION



Drill and Chamfer Thread Mills



Material Group	vc (m/min)	Thread milling fz (mm/tooth)		Drilling fn (mm/rev)		
		Cutter diameter ≤ ø8.0	Cutter diameter > ø8.0	Cutter diameter ≤ ø8.0	Cutter diameter > ø8.0	
K	31 Grey cast iron soft	115 (80-150)	0.055 (0.03 - 0.08)	0.1 (0.08 - 0.12)	0.15 (0.1 - 0.2)	0.225 (0.2 - 0.25)
	32 Grey cast iron hard					
	33 Nodular graphite cast iron <200HB					
	34 Nodular graphite cast iron <300HB					
N	71 Aluminium, Magnesium, unalloyed	200 (100-300)	0.075 (0.05 - 0.1)	0.125 (0.1 - 0.15)	0.15 (0.1 - 0.2)	0.25 (0.2 - 0.3)
	72 Aluminium, alloyed Si < 0.5%					
	73 Aluminium, alloyed, Si < 10%					
	74 Aluminium, alloyed, Si > 10%					
O	81 Thermoplastics	115 (80-150)	0.075 (0.05 - 0.1)	0.125 (0.1 - 0.15)	0.15 (0.1 - 0.2)	0.25 (0.2 - 0.3)
	82 Thermosetting Plastics					

► For programming details see page 130

Miniature Thread Mills <62HRc



Material Group	vc (m/min)	fz (mm/tooth)	
		Cutter diameter ≤ ø6.0	Cutter diameter > ø6.0
P	100 (80-120)	11 Magnetic soft steels	0.03 (0.02 - 0.04)
		12 Structural steels, case carburizing steels	0.05 (0.04 - 0.06)
H	45 (25-70)	15 Hardened steels 45 - 50HRc	0.04 (0.03 - 0.05)
		16 Hardened steels 51 - 55HRc	0.06 (0.05 - 0.07)
		15 Hardened steels 56 - 62HRc	0.03 (0.02 - 0.04)
M	60 (40-80)	21 Free machining stainless steel	0.05 (0.04 - 0.06)
		22 Austenitic stainless steel	0.03 (0.02 - 0.04)
		23 Ferritic, Ferritic+Austenitic, Martensitic	0.05 (0.04 - 0.06)
		31 Grey cast iron soft	0.04 (0.03 - 0.05)
K	75 (50-100)	32 Grey cast iron hard	0.06 (0.05 - 0.07)
		33 Nodular graphite cast iron <200HB	0.04 (0.03 - 0.05)
		34 Nodular graphite cast iron <300HB	0.06 (0.05 - 0.07)
		41 Titanium, unalloyed	0.025 (0.02 - 0.03)
S	40 (20-60)	42 Titanium, alloyed <270HB	0.04 (0.03 - 0.05)
		43 Titanium, alloyed <350HB	0.025 (0.02 - 0.03)
		51 Nickel, unalloyed	0.025 (0.02 - 0.03)
		52 Heat resisting alloys <270HB	0.04 (0.03 - 0.05)
		53 Heat resisting alloys <350HB	0.04 (0.03 - 0.05)
N	200 (100-300)	61 Copper, unalloyed	0.05 (0.03 - 0.07)
		62 Short chipping Brass, Bronze, Copper	0.075 (0.05 - 0.1)
		63 Long chipping Brass, Bronze, Copper	0.05 (0.03 - 0.07)
		64 AMPCO (Cu-Al-Fe alloys)	0.075 (0.05 - 0.1)
N	200 (100-300)	71 Aluminium, Magnesium, unalloyed	0.05 (0.03 - 0.07)
		72 Aluminium, alloyed Si < 0.5%	0.075 (0.05 - 0.1)
		73 Aluminium, alloyed, Si < 10%	0.05 (0.03 - 0.07)
		74 Aluminium, alloyed, Si > 10%	0.075 (0.05 - 0.1)

► For programming details see page 130

THREAD MILL CUTTING CONDITION



Through Coolant and Solid Thread Mills



Material Group	vc (m/min)	fz (mm/tooth)	
		Cutter diameter ≤ ø8.0	Cutter diameter > ø8.0
P	100 (80-120)	11 Magnetic soft steels	0.07 (0.04 - 0.1)
		12 Structural steels, case carburizing steels	0.03 (0.02 - 0.04)
		13 Plain carbon steels	0.07 (0.04 - 0.1)
		14 Alloy steels	0.03 (0.02 - 0.04)
H	80 (60-100)	15 Alloy steels/Hardened & Tempered steels	0.07 (0.04 - 0.1)
M	60 (40-80)	21 Free machining stainless steel	0.04 (0.02 - 0.06)
		22 Austenitic stainless steel	0.015 (0.01 - 0.02)
		23 Ferritic, Ferritic+Austenitic, Martensitic	0.04 (0.02 - 0.06)
K	75 (50-100)	31 Grey cast iron soft	0.07 (0.04 - 0.1)
		32 Grey cast iron hard	0.03 (0.02 - 0.04)
		33 Nodular graphite cast iron <200HB	0.07 (0.04 - 0.1)
		34 Nodular graphite cast iron <300HB	0.03 (0.02 - 0.04)
S	40 (20-60)	41 Titanium, unalloyed	0.04 (0.02 - 0.06)
		42 Titanium, alloyed <270HB	0.015 (0.01 - 0.02)
		43 Titanium, alloyed <350HB	0.04 (0.02 - 0.06)
		51 Nickel, unalloyed	0.015 (0.01 - 0.02)
		52 Heat resisting alloys <270HB	0.04 (0.02 - 0.06)
N	200 (100-300)	61 Copper, unalloyed	0.04 (0.02 - 0.06)
		62 Short chipping Brass, Bronze, Copper	0.05 (0.03 - 0.07)
		63 Long chipping Brass, Bronze, Copper	0.075 (0.05 - 0.1)
		64 AMPCO (Cu-Al-Fe alloys)	0.05 (0.03 - 0.07)
N	200 (100-300)	71 Aluminium, Magnesium, unalloyed	0.05 (0.03 - 0.07)
		72 Aluminium, alloyed Si < 0.5%	0.075 (0.05 - 0.1)
		73 Aluminium, alloyed, Si < 10%	0.05 (0.03 - 0.07)
		74 Aluminium, alloyed, Si > 10%	0.075 (0.05 - 0.1)

► For programming details see page 130

vc - cutting speed (m/min)
 n - RPM (rev/min)
 fz - feed rate (mm/tooth)
 f - feed rate (mm/rev)
 z - No. of teeth
 f1 - feed at cutting edge
 f2 - feed at centre line
 D - thread major diameter

$$\text{To calculate RPM from cutting speed: } n = \frac{v_c \cdot 1000}{\pi \cdot \varnothing}$$

$$\text{To calculate feed per revolution: } f_1 = n \cdot f_z \cdot z$$

$$\text{To calculate feed at tool centre line: } f_2 = \frac{f_1 \cdot (D - \varnothing)}{D}$$

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.

SUPERIOR PERFORMANCE



HARDSLICK SP/POINT & SP/FLUTE

APPLICATION TAPS
























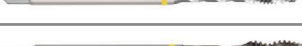
IDEAL FOR MATERIAL GROUPS



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○	○	○											○						●				●	●	●					TM3716	AL		Metric Bright DIN371/376 M2 - M20	P.37						
●	●																		○				○							TM1730	CS		Metric Vap DIN371/376 M3 - M20	P.48						
●	●					●	●	●					○				○													TM2530	VA/CS		Metric Vap DIN371/376 M3 - M20	P.39						
●	●					●	●	●					○				○													TM8153	VA/CS		Metric Hardslick DIN371/376 M3 - M30	P.40						
●	●					●	●	●					○				○													TM3830	VA/CS		Metric Fine Vap DIN374 M4 - M24	P.42						
●	●					●	●	●					○				○													TM6530	VA/CS		UNC Vap DIN371/376 No.4 - 1"	P.44						
●	●					●	●	●					○				○													TM6830	VA/CS		UNF Vap DIN371/374 No.4 - 1"	P.46						
				○	●			○											○		●						○	○	TM2330	HA		Metric Vap DIN371/376 M2 - M20	P.49							
			○	●				○					○				○													TM6316	HS		Metric Bright DIN371/376 M2 - M20	P.51						
			○	●				○					○				○													TM1530	HS		Metric Vap DIN371/376 M2 - M30	P.55						
			○	●				○					○				○													TM2130	HS		Metric Vap DIN371/376 M3 - M20	P.54						
			○	●				○					○				○													TM2817	HS		Metric TiN DIN371/376 M2 - M20	P.53						
●	●	●							●	●	○		○				○		●		○	○	○	●	○				TM0216	GS		Metric Bright 20° Spiral DIN352 M3 - M20	P.57							
●	●	●							●	●	○		○				○		●		○	○	○	●	○				TM1316	GS		Metric Bright 20° Spiral DIN371/376 M2 - M20	P.59							
●	●	●							●	●	○		○				○		●		○	○	○	●	○				TM1716	GS		Metric Bright DIN371/376 M2 - M20	P.61							
●	●	●							●	●	○		○				○		●		○	○	○	●	○				TM1917	GS		Metric TiN DIN371/376 M2 - M30	P.63							
●	●	●							●	●	○		○				○		●		○	○	○	●	○				TM3416	GS		Metric Fine Bright DIN374 M4 - M30	P.66,67							
●	●	●							●	●	○		○				○		●		○	○	○	●	○				TM6516	GS		UNC Bright DIN371/376 No.4 - 1"	P.68							
●	●	●							●	●	○		○				○		●		○	○	○	●	○				TM6816	GS		UNF Bright DIN371/374 No.4 - 1"	P.70							
●	●	●							●	●	○		○				○		●		○	○	○	●	○				TB0216	GS		BSP Bright DIN5156 1/8" - 1"	P.73							
				●	●								○	●	●		●				○									TM7210	TI&NI		Metric HSS-PM Bright DIN371/376 M2 - M12	P.74						
				●	●								○	●	●		●				○									TM7428	NI		Metric HSS-PM TiAIN DIN371/376 M2 - M30	P.78,79						

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11	12	13	14	15	16	21	22	23	31	32	33	34	41	42	43	51	52	53	61	62	63	64	71	72	73	74	81	82	83	Code	Type	Item	Description	Page No.									
○	○	○											○						●					●	●	●				TM0516	AL		Metric Bright DIN371/376 M2 - M20	P.36									
●	●					●	●	●					○			○														TM3130	VA/CS		Metric Vap DIN371/376 M2 - M20	P.38									
●	●					●	●	●					○			○														TM8053	VA/CS		Metric Hardslick DIN371/376 M3 - M30	P.41									
●	●					●	●	●					○			○														TM3630	VA/CS		Metric Fine Vap DIN374 M4 - M24	P.43									
●	●					●	●	●					○			○														TM6430	VA/CS		UNC Vap DIN371/376 No.4 - 1"	P.45									
●	●					●	●	●					○			○														TM6730	VA/CS		UNF Vap DIN371/374 No.4 - 1"	P.47									
				○	●			○					○			○														TM2716	HS		Metric Bright DIN371/376 M2 - M30	P.50									
				○	●			○					○			○														TM2917	HS		Metric TiN DIN371/376 M3 - M20	P.52									
●	●	●							●	●	○		○			○			○	●		○	○	○	●	○				TM0116	GS		Metric Bright DIN352 M2 - M16	P.56									
●	●	●							●	●	○		○			○			○	●		○	○	○	●	○				TM0316	GS		Metric Bright DIN371 M2 - M12	P.58									
●	●	●							●	●	○		○			○			○	●		○	○	○	●	○				TM0416	GS		Metric Bright DIN376 M3 - M27	P.60									
●	●	●							●	●	○		○			○			○	●		○	○	○	●	○				TM1817	GS		Metric TiN DIN371 M2 - M12	P.62									
●	●	●							●	●	○		○			○			○	●		○	○	○	●	○				TM3316	GS		Metric Fine Bright DIN374 M4 - M30	P.64,65									
●	●	●							●	●	○		○			○			○	●		○	○	○	●	○				TM6416	GS		UNC Bright DIN371/376 No.4 - 1"	P.69									
●	●	●							●	●	○		○			○			○	●		○	○	○	●	○				TM6716	GS		UNF Bright DIN371/374 No.4 - 1"	P.71									
●	●	●							●	●	○		○			○			○	●		○	○	○	●	○				TB0116	GS		BSP Bright DIN5156 1/8" - 1"	P.72									
				●	●								○	●	●	●	●			○										TM7110	TI&NI		Metric HSS-PM Bright DIN371/376 M2 - M12	P.75									
				●	●								○	●	●	●	●			○										TM7328	NI		Metric HSS-PM TiAlN DIN371/376 M2 - M30	P.76,77									
																																		COLD FORMING TAPS									
●	●	●	●			●	●						●		●				●	○		●	○							TM3817	GV		Metric TiN DIN371/376 M2 - M20	P.81									
●	●	●	●										●		●				●	○		●	○							TM3827	GV		Metric TiAlN DIN371/376 M2 - M20	P.80									
																																		STRAIGHT FLUTE TAPS									
									●	●									○										●	TM0731	GG		Metric Nitrided DIN371/376 M3 - M20	P.82									
									●	●									●										●	TM0917	GG		Metric TiN DIN371/376 M2 - M16	P.83									
○	○	○	○										○	○					○	○										TM5016	GS		Metric Bright DIN357 M4 - M12	P.84									
																																									Cutting Data		P.85

► For material group examples, refer to page 2
 ► For full material group tables, refer to pages 140 - 145

M METRIC COARSE THREADS



HSS-E DIN 371/376 6H 60° B Bright

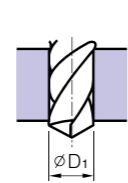
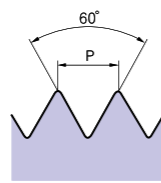
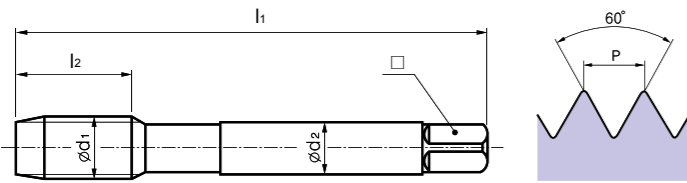
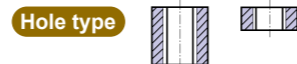
Series No. TM0516, TM0616

▶ cutting conditions : p.89

Spiral point.
Interrupted thread for reduced torque.
Aluminium and Aluminium alloys.



Material groups **AL**



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM05160200
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM05160250
M 3	X	0.5	6	56	3.5	2.7	2.5	TM05160300
M 4	X	0.7	7	63	4.5	3.4	3.3	TM05160400
M 5	X	0.8	8	70	6	4.9	4.2	TM05160500
M 6	X	1.0	10	80	6	4.9	5	TM05160600
M 8	X	1.25	13	90	8	6.2	6.8	TM05160800
M 10	X	1.5	15	100	10	8	8.5	TM05161000
M 12	X	1.75	18	110	9	7	10.2	TM06161200
M 14	X	2.0	26	110	11	9	12	TM06161400
M 16	X	2.0	20	110	12	9	14	TM06161600
M 18	X	2.5	30	125	14	11	15.5	TM06161800
M 20	X	2.5	32	140	16	12	17.5	TM06162000

▶ DIN 371(M2-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	16	21	22	31	32	41	42	43	61	62	63	64	81	82
○	○							○			●					
13	14	16	17	23	24	33	34	51	52	53	71	72	73	74	83	
○											●	●	●			

M METRIC COARSE THREADS

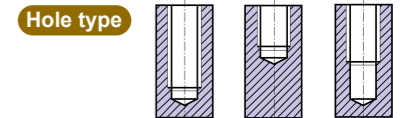


HSS-E DIN 371/376 6H 60° C Bright R45

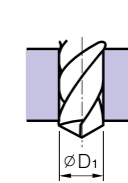
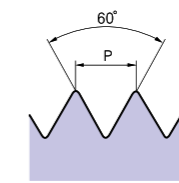
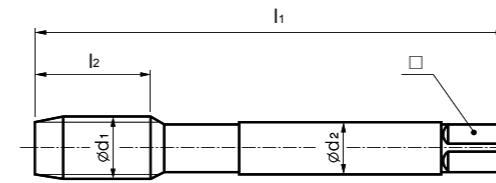
Series No. TM3716

▶ cutting conditions : p.89

Spiral flute.
Excellent chip evacuation due to 45° helix angle.
Aluminium and Aluminium alloys.



Material groups **AL**



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM37160200
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM37160250
M 3	X	0.5	6	56	3.5	2.7	2.5	TM37160300
M 3.5	X	0.6	7	56	4	3	2.9	TM37160350
M 4	X	0.7	7	63	4.5	3.4	3.3	TM37160400
M 5	X	0.8	8	70	6	4.9	4.2	TM37160500
M 6	X	1.0	10	80	6	4.9	5	TM37160600
M 8	X	1.25	13	90	8	6.2	6.8	TM37160800
M 10	X	1.5	15	100	10	8	8.5	TM37161000
M 12	X	1.75	18	110	9	7	10.2	TM37161200
M 14	X	2.0	20	110	11	9	12	TM37161400
M 16	X	2.0	20	110	12	9	14	TM37161600
M 18	X	2.5	25	125	14	11	15.5	TM37161800
M 20	X	2.5	25	140	16	12	17.5	TM37162000

▶ DIN 371(M2-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	16	21	22	31	32	41	42	43	61	62	63	64	81	82
○	○							○			●					
13	14	16	17	23	24	33	34	51	52	53	71	72	73	74	83	
○											●	●	●			

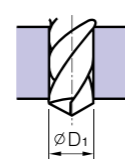
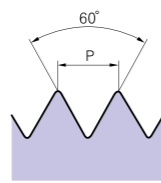
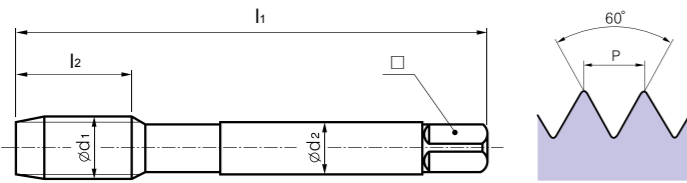
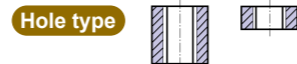
M METRIC COARSE THREADS



Series No. TM3130, TM3230

▶ cutting conditions : p.89

Spiral point.
Thick web for higher cutting speed.
Stainless steel and tough materials.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM31300200
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM31300250
M 3	X	0.5	11	56	3.5	2.7	2.5	TM31300300
M 4	X	0.7	13	63	4.5	3.4	3.3	TM31300400
M 5	X	0.8	15	70	6	4.9	4.2	TM31300500
M 6	X	1.0	17	80	6	4.9	5	TM31300600
M 8	X	1.25	20	90	8	6.2	6.8	TM31300800
M 10	X	1.5	22	100	10	8	8.5	TM31301000
M 12	X	1.75	24	110	9	7	10.2	TM32301200
M 14	X	2.0	26	110	11	9	12	TM32301400
M 16	X	2.0	27	110	12	9	14	TM32301600
M 18	X	2.5	30	125	14	11	15.5	TM32301800
M 20	X	2.5	32	140	16	12	17.5	TM32302000

▶ DIN 371(M2-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H			M		K			S				N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82				
●	●		●	●					○										
13	14	16	23		33	34	51	52	53	71	72	73	74	83					
			●						○										

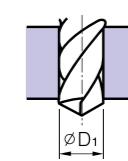
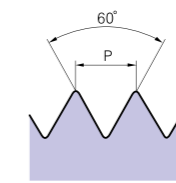
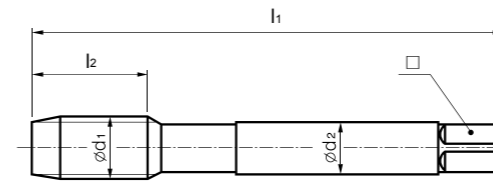
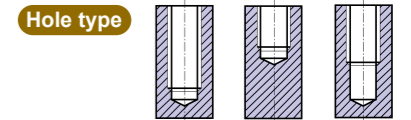
M METRIC COARSE THREADS



Series No. TM2530, TM2630

▶ cutting conditions : p.89

Spiral flute.
Recessed threads for tapping deep holes.
Stainless steel and tough materials.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 3	X	0.5	6	56	3.5	2.7	2.5	TM25300300
M 4	X	0.7	7	63	4.5	3.4	3.3	TM25300400
M 5	X	0.8	8	70	6	4.9	4.2	TM25300500
M 6	X	1.0	10	80	6	4.9	5	TM25300600
M 8	X	1.25	13	90	8	6.2	6.8	TM25300800
M 10	X	1.5	15	100	10	8	8.5	TM25301000
M 12	X	1.75	18	110	9	7	10.2	TM26301200
M 14	X	2.0	20	110	11	9	12	TM26301400
M 16	X	2.0	20	110	12	9	14	TM26301600
M 18	X	2.5	25	125	14	11	15.5	TM26301800
M 20	X	2.5	25	140	16	12	17.5	TM26302000

▶ DIN 371(M3-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H			M		K			S				N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82				
●	●		●	●					○										
13	14	16	23		33	34	51	52	53	71	72	73	74	83					
			●						○										

M METRIC COARSE THREADS



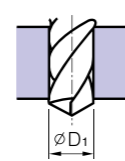
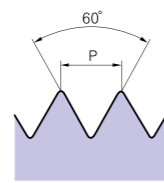
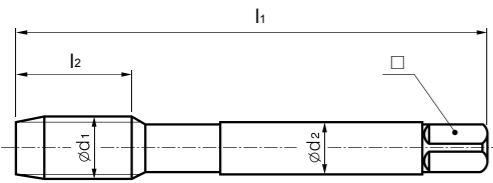
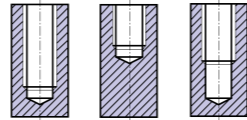
Series No. TM8153

▶ cutting conditions : p.88

Spiral flute.
Recessed threads for tapping deep holes.
Stainless steel and tough materials.
Hardslick coated for increased tool life.



Hole type



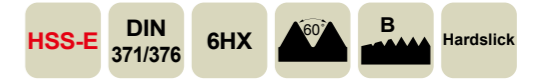
Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 3	X	0.5	11	56	3.5	2.7	2.5	TM81530300
M 4	X	0.7	13	63	4.5	3.4	3.3	TM81530400
M 5	X	0.8	15	70	6	4.9	4.2	TM81530500
M 6	X	1.0	17	80	6	4.9	5	TM81530600
M 8	X	1.25	20	90	8	6.2	6.8	TM81530800
M 10	X	1.5	22	100	10	8	8.5	TM81531000
M 12	X	1.75	24	110	9	7	10.2	TM81531200
M 14	X	2.0	20	110	11	9	12	TM81531400
M 16	X	2.0	27	110	12	9	14	TM81531600
M 18	X	2.5	30	125	14	11	15.5	TM81531800
M 20	X	2.5	25	140	16	12	17.5	TM81532000
M 22	X	2.5	25	140	18	14.5	19.5	TM81532200
M 24	X	3.0	30	160	18	14.5	21	TM81532400
M 27	X	3.0	30	160	20	16	24	TM81532700
M 30	X	3.5	35	180	22	18	26.5	TM81533000

▶ DIN 371(M3-M10) DIN 376(M12-M30)

●: Excellent ○: Good

P		H			M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82		
●	●		●	●					○								
13	14	16	23		33	34	51	52	53	71	72	73	74	83			
			●						○								

M METRIC COARSE THREADS



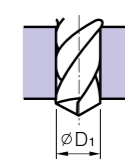
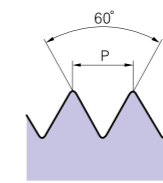
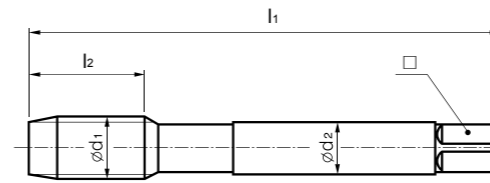
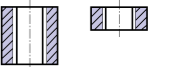
Series No. TM8053

▶ cutting conditions : p.88

Spiral point.
Thick web for higher cutting speed.
Stainless steel and tough materials.
Hardslick coated for increased tool life.



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 3	X	0.5	11	56	3.5	2.7	2.5	TM80530300
M 4	X	0.7	13	63	4.5	3.4	3.3	TM80530400
M 5	X	0.8	15	70	6	4.9	4.2	TM80530500
M 6	X	1.0	17	80	6	4.9	5	TM80530600
M 8	X	1.25	20	90	8	6.2	6.8	TM80530800
M 10	X	1.5	22	100	10	8	8.5	TM80531000
M 12	X	1.75	24	110	9	7	10.2	TM80531200
M 14	X	2.0	26	110	11	9	12	TM80531400
M 16	X	2.0	27	110	12	9	14	TM80531600
M 18	X	2.5	30	125	14	11	15.5	TM80531800
M 20	X	2.5	32	140	16	12	17.5	TM80532000
M 22	X	2.5	32	140	18	14.5	19.5	TM80532200
M 24	X	3.0	34	160	18	14.5	21	TM80532400
M 27	X	3.0	36	160	20	16	24	TM80532700
M 30	X	3.5	40	180	22	18	26.5	TM80533000

▶ DIN 371(M3-M10) DIN 376(M12-M30)

●: Excellent ○: Good

P		H			M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82		
●	●		●	●					○								
13	14	16	23		33	34	51	52	53	71	72	73	74	83			
			●						○								

MF METRIC FINE THREADS



Series No. TM3830

▶ cutting conditions : p.89

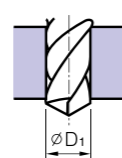
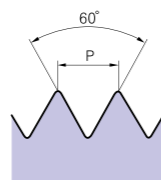
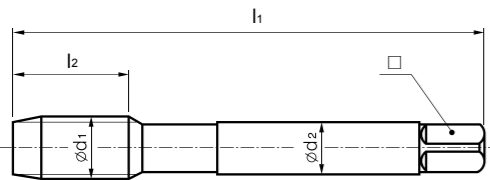
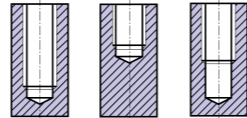
Spiral flute.
Stainless steel and tough materials.



DIN 374



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 4	X	0.5	5	63	2.8	2.1	3.5	TM38300400
M 5	X	0.5	5	70	3.5	2.7	4.5	TM38300500
M 6	X	0.5	5	80	4.5	3.4	5.5	TM38300600
M 6	X	0.75	8	80	4.5	3.4	5.2	TM38300601
M 8	X	0.75	8	80	6	4.9	7.2	TM38300800
M 8	X	1.0	10	90	6	4.9	7	TM38300801
M 10	X	0.75	10	90	7	5.5	9.2	TM38301000
M 10	X	1.0	10	90	7	5.5	9	TM38301001
M 10	X	1.25	16	100	7	5.5	8.8	TM38301002
M 12	X	1.0	11	100	9	7	11	TM38301200
M 12	X	1.25	15	100	9	7	10.8	TM38301201
M 12	X	1.5	15	100	9	7	10.5	TM38301202
M 14	X	1.25	15	100	11	9	12.8	TM38301400
M 14	X	1.5	15	100	11	9	12.5	TM38301401
M 16	X	1.5	15	100	12	9	14.5	TM38301600
M 18	X	1.5	17	110	14	11	16.5	TM38301800
M 20	X	1.5	17	125	16	12	18.5	TM38302000
M 22	X	1.5	17	125	18	14.5	20.5	TM38302200
M 24	X	1.5	20	140	18	14.5	22.5	TM38302400

▶ DIN 374(M4-M24)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●		●	●					○							
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
			●						○							

MF METRIC FINE THREADS



Series No. TM3630

▶ cutting conditions : p.89

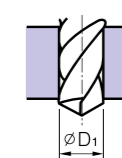
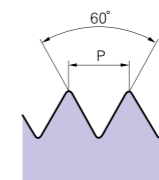
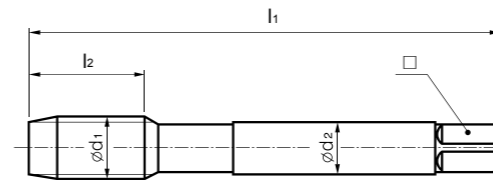
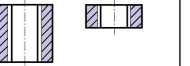
Spiral point.
Thick web for higher cutting speed.
Stainless steel and tough materials.



DIN 374



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 4	X	0.5	10	63	2.8	2.1	3.5	TM36300400
M 5	X	0.5	11	70	3.5	2.7	4.5	TM36300500
M 6	X	0.5	13	80	4.5	3.4	5.5	TM36300600
M 6	X	0.75	13	80	4.5	3.4	5.2	TM36300601
M 8	X	0.75	14	80	6	4.9	7.2	TM36300800
M 8	X	1.0	17	90	6	4.9	7	TM36300801
M 10	X	0.75	18	90	7	5.5	9.2	TM36301000
M 10	X	1.0	18	90	7	5.5	9	TM36301001
M 10	X	1.25	22	100	7	5.5	8.8	TM36301002
M 12	X	1.0	18	100	9	7	11	TM36301200
M 12	X	1.25	22	100	9	7	10.8	TM36301201
M 12	X	1.5	22	100	9	7	10.5	TM36301202
M 14	X	1.25	22	100	11	9	12.8	TM36301400
M 14	X	1.5	22	100	11	9	12.5	TM36301401
M 16	X	1.5	22	100	12	9	14.5	TM36301600
M 18	X	1.5	25	110	14	11	16.5	TM36301800
M 20	X	1.5	25	125	16	12	18.5	TM36302000
M 22	X	1.5	25	125	18	14.5	20.5	TM36302200
M 24	X	1.5	27	140	18	14.5	22.5	TM36302400

▶ DIN 374(M4-M24)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●		●	●					○							
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
			●						○							

UNC UNIFIED COARSE THREADS



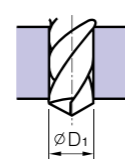
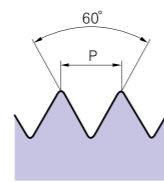
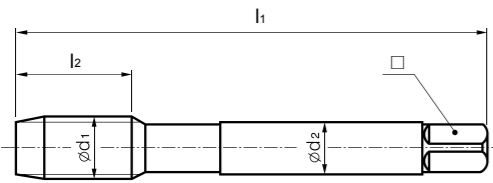
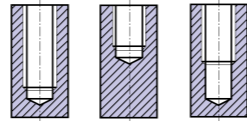
Series No. TM6530

▶ cutting conditions : p.89

Spiral flute.
Stainless steel and tough materials.



Hole type



Ød ₁ inch	X	P inch	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
No.4	X	40	6	56	3.5	2.7	2.3	TM65300400
No.5	X	40	7	56	3.5	2.7	2.6	TM65300500
No.6	X	32	7	56	4	3	2.85	TM65300600
No.8	X	32	8	63	4.5	3.4	3.5	TM65300800
No.10	X	24	10	70	6	4.9	3.9	TM65301000
No.12	X	24	10	80	6	4.9	4.5	TM65301200
1/4	X	20	13	80	7	5.5	5.2	TM65309160
5/16	X	18	14	90	8	6.2	6.6	TM65309200
3/8	X	16	16	100	9	7	8	TM65309240
7/16	X	14	17	100	8	6.2	9.4	TM65309280
1/2	X	13	20	110	9	7	10.75	TM65309320
9/16	X	12	20	110	11	9	12.25	TM65309360
5/8	X	11	22	110	12	9	13.5	TM65309400
3/4	X	10	25	125	14	11	16.5	TM65309480
7/8	X	9	27	140	18	14.5	19.5	TM65309560
1"	X	8	30	160	20	16	22.25	TM65309640

▶ DIN 371(No.4-3/8") DIN 376(7/16"-1")

●: Excellent ○: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●		●	●					○						
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
			●						○						

UNC UNIFIED COARSE THREADS



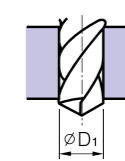
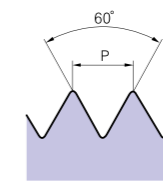
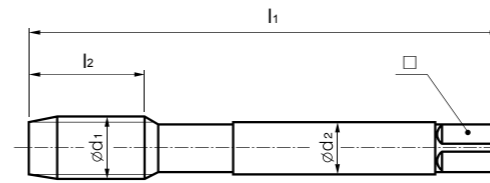
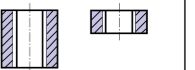
Series No. TM6430

▶ cutting conditions : p.89

Spiral point.
Thick web for higher cutting speed.
Stainless steel and tough materials.



Hole type



Ød ₁ inch	X	P inch	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
No.4	X	40	11	56	3.5	2.7	2.3	TM64300400
No.5	X	40	11	56	3.5	2.7	2.6	TM64300500
No.6	X	32	12	56	4	3	2.85	TM64300600
No.8	X	32	13	63	4.5	3.4	3.5	TM64300800
No.10	X	24	15	70	6	4.9	3.9	TM64301000
No.12	X	24	16	80	6	4.9	4.5	TM64301200
1/4	X	20	17	80	7	5.5	5.2	TM64309160
5/16	X	18	20	90	8	6.2	6.6	TM64309200
3/8	X	16	22	100	9	7	8	TM64309240
7/16	X	14	22	100	8	6.2	9.4	TM64309280
1/2	X	13	25	110	9	7	10.75	TM64309320
9/16	X	12	26	110	11	9	12.25	TM64309360
5/8	X	11	27	110	12	9	13.5	TM64309400
3/4	X	10	30	125	14	11	16.5	TM64309480
7/8	X	9	32	140	18	14.5	19.5	TM64309560
1"	X	8	36	160	20	16	22.25	TM64309640

▶ DIN 371(No.4-3/8") DIN 376(7/16"-1")

●: Excellent ○: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
●	●		●	●					○						
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
			●						○						

UNF UNIFIED FINE THREADS



Series No. TM6830

▶ cutting conditions : p.89

Spiral flute.
Stainless steel and tough materials.

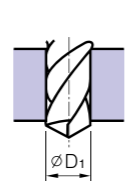
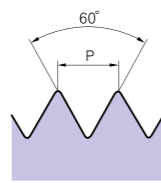
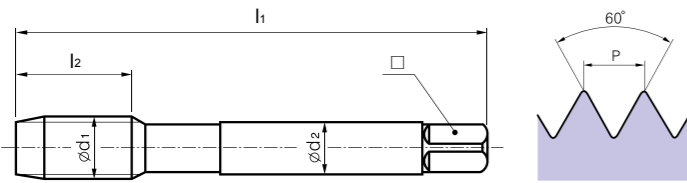
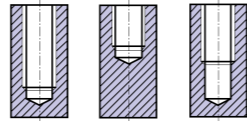


DIN 371

DIN 374



Hole type



Ød ₁ inch	X	P inch	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
No.4	X	48	9	56	3.5	2.7	2.4	TM68300400
No.5	X	44	7	56	3.5	2.7	2.7	TM68300500
No.6	X	40	7	56	4	3	3	TM68300600
No.8	X	36	8	63	4.5	3.4	3.5	TM68300800
No.10	X	32	10	70	6	4.9	4.1	TM68301000
No.12	X	28	10	80	6	4.9	4.7	TM68301200
1/4	X	28	10	80	7	5.5	5.5	TM68309160
5/16	X	24	10	90	8	6.2	6.9	TM68309200
3/8	X	24	10	100	9	7	8.5	TM68309240
7/16	X	20	13	100	8	6.2	9.9	TM68309280
1/2	X	20	13	100	9	7	11.5	TM68309320
9/16	X	18	15	100	11	9	12.9	TM68309360
5/8	X	18	15	100	12	9	14.5	TM68309400
3/4	X	16	17	110	14	11	17.5	TM68309480
7/8	X	14	17	125	18	14.5	20.5	TM68309560
1"	X	12	20	140	20	16	23.25	TM68309640

▶ DIN 371(No.4-3/8") DIN 374(7/16"-1")

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●		●	●					○							
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
			●						○							

UNF UNIFIED FINE THREADS



Series No. TM6730

▶ cutting conditions : p.89

Spiral point.
Thick web for higher cutting speed.
Stainless steel and tough materials.

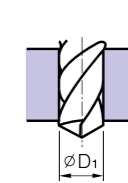
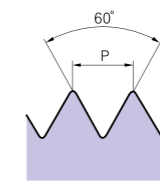
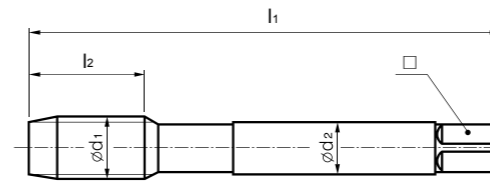
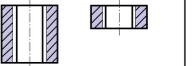


DIN 371

DIN 374



Hole type



Ød ₁ inch	X	P inch	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
No.4	X	48	11	56	3.5	2.7	2.4	TM67300400
No.5	X	44	11	56	3.5	2.7	2.7	TM67300500
No.6	X	40	12	56	4	3	3	TM67300600
No.8	X	36	13	63	4.5	3.4	3.5	TM67300800
No.10	X	32	13	70	6	4.9	4.1	TM67301000
No.12	X	28	16	80	6	4.9	4.7	TM67301200
1/4	X	28	17	80	7	5.5	5.5	TM67309160
5/16	X	24	17	90	8	6.2	6.9	TM67309200
3/8	X	24	18	100	9	7	5.8	TM67309240
7/16	X	20	22	100	8	6.2	9.9	TM67309280
1/2	X	20	22	100	9	7	11.5	TM67309320
9/16	X	18	22	100	11	9	12.9	TM67309360
5/8	X	18	22	100	12	9	14.5	TM67309400
3/4	X	16	25	110	14	11	17.5	TM67309480
7/8	X	14	26	125	18	14.5	20.5	TM67309560
1"	X	12	28	140	20	16	23.25	TM67309640

▶ DIN 371(No.4-3/8") DIN 374(7/16"-1")

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
●	●		●	●					○							
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
			●						○							

M METRIC COARSE THREADS



Series No. TM1730, TM1830

▶ cutting conditions : p.89

Spiral flute.
Low carbon steels.

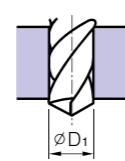
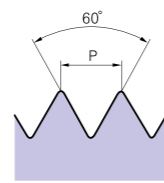
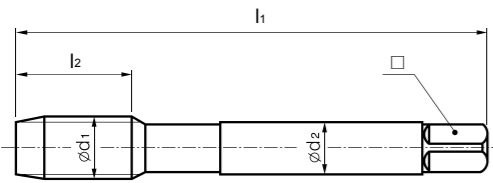
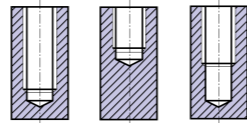


DIN 371

DIN 376



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 3	X	0.5	6	45	3.5	2.7	2.5	TM17300300
M 4	X	0.7	7	63	4.5	3.4	3.3	TM17300400
M 5	X	0.8	8	70	6	4.9	4.2	TM17300500
M 6	X	1.0	10	80	6	4.9	5	TM17300600
M 8	X	1.25	13	90	8	6.2	6.8	TM17300800
M 10	X	1.5	15	100	10	8	8.5	TM17301000
M 12	X	1.75	18	110	9	7	10.2	TM18301200
M 14	X	2.0	20	110	11	9	12	TM18301400
M 16	X	2.0	20	110	12	9	14	TM18301600
M 18	X	2.5	25	125	14	11	15.5	TM18301800
M 20	X	2.0	25	140	16	12	17.5	TM18302000

▶ DIN 371(M3-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H			M		K			S				N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82				
●	●									○									
13	14	16	23		33	34	51	52	53	71	72	73	74	83					
										○									

M METRIC COARSE THREADS



Series No. TM2330, TM2430

▶ cutting conditions : p.87

Spiral flute.
High tensile steels >1200N/mm²
and hardened materials.

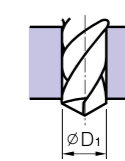
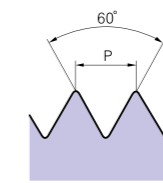
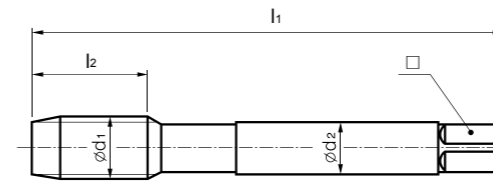
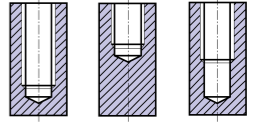


DIN 371

DIN 376



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM23300200
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM23300250
M 3	X	0.5	6	56	3.5	2.7	2.5	TM23300300
M 4	X	0.7	7	66	4.5	3.4	3.3	TM23300400
M 5	X	0.8	8	70	6	4.9	4.2	TM23300500
M 6	X	1.0	10	80	6	4.9	5	TM23300600
M 8	X	1.25	13	90	8	6.2	6.8	TM23300800
M 10	X	1.5	15	100	10	8	8.5	TM23301000
M 12	X	1.75	18	110	9	7	10.2	TM24301200
M 14	X	2.0	20	110	11	9	12	TM24301400
M 16	X	2.0	20	110	12	9	14	TM24301600
M 18	X	2.5	25	125	14	11	15.5	TM24301800
M 20	X	2.5	25	140	16	12	17.5	TM24302000

▶ DIN 371(M2-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H			M		K			S				N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82				
		○									○		●		○				
13	14	16	23		33	34	51	52	53	71	72	73	74	83					
		●	○														○		

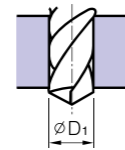
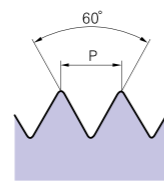
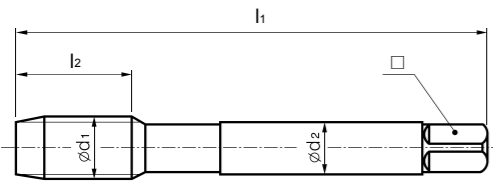
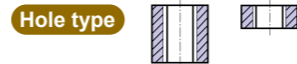
M METRIC COARSE THREADS



Series No. TM2716, TM2816

▶ cutting conditions : p.87

Spiral point.
Thick web for higher cutting speed.
High tensile steels <1200N/mm² and hardened materials.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM27160200
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM27160250
M 3	X	0.5	11	56	3.5	2.7	2.5	TM27160300
M 3.5	X	0.6	12	56	4	3	2.9	TM27160350
M 4	X	0.7	13	63	4.5	3.4	3.3	TM27160400
M 4.5	X	0.75	14	70	6	4.9	3.7	TM27160450
M 5	X	0.8	15	70	6	4.9	4.2	TM27160500
M 6	X	1.0	17	80	6	4.9	5	TM27160600
M 8	X	1.25	20	90	8	6.2	6.8	TM27160800
M 10	X	1.5	22	100	10	8	8.5	TM27161000
M 12	X	1.75	24	110	9	7	10.2	TM28161200
M 14	X	2.0	26	110	11	9	12	TM28161400
M 16	X	2.0	27	110	12	9	14	TM28161600
M 18	X	2.5	30	125	14	11	15.5	TM28161800
M 20	X	2.5	32	140	16	12	17.5	TM28162000
M 22	X	2.5	32	140	18	14.5	19.5	TM28162200
M 24	X	3.0	34	160	18	14.5	21	TM28162400
M 27	X	3.0	36	160	20	16	24	TM28162700
M 30	X	3.5	40	180	22	18	26.5	TM28163000

▶ DIN 371(M2-M10) DIN 376(M12-M30)

●: Excellent ○: Good

P	H	M	K	S	N	O									
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
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13	14	16	23		33	34	51	52	53	71	72	73	74	83	
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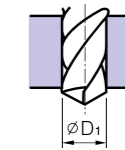
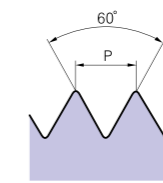
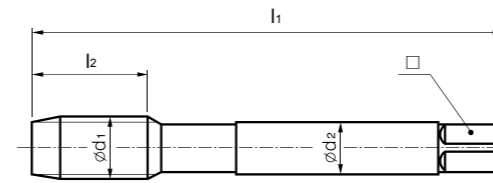
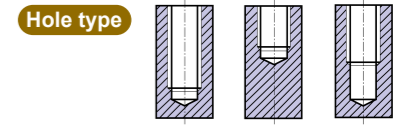
M METRIC COARSE THREADS



Series No. TM6316

▶ cutting conditions : p.87

Spiral flute.
High tensile steels <1200N/mm² and hardened materials.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM63160200
M 2.2	X	0.45	8	45	2.8	2.1	1.75	TM63160220
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM63160250
M 3	X	0.5	6	56	3.5	2.7	2.5	TM63160300
M 3.5	X	0.6	7	56	4	3	2.9	TM63160350
M 4	X	0.7	7	63	4.5	3.4	3.3	TM63160400
M 5	X	0.8	8	70	6	4.9	4.2	TM63160500
M 6	X	1.0	10	80	6	4.9	5	TM63160600
M 8	X	1.25	13	90	8	6.2	6.8	TM63160800
M 10	X	1.5	15	100	10	8	8.5	TM63161000
M 12	X	1.75	18	110	9	7	10.2	TM63161200
M 14	X	2.0	20	110	11	9	12	TM63161400
M 16	X	2.0	20	110	12	9	14	TM63161600
M 18	X	2.5	25	125	14	11	15.5	TM63161800
M 20	X	2.5	25	140	16	12	17.5	TM63162000

▶ DIN 371(M3-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P	H	M	K	S	N	O									
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
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13	14	16	23		33	34	51	52	53	71	72	73	74	83	
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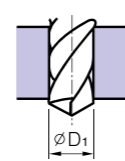
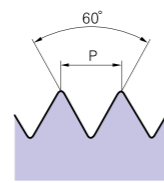
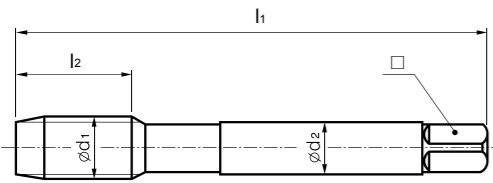
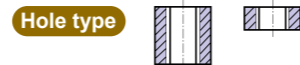
M METRIC COARSE THREADS



Series No. TM2917, TM3017

▶ cutting conditions : p.87

Spiral point.
Thick web for higher cutting speed.
High tensile steels >1200N/mm² and hardened materials.
TiN coated for increased tool life.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 3	X	0.5	6	56	3.5	2.7	2.5	TM29170300
M 4	X	0.7	7	63	4.5	3.4	3.3	TM29170400
M 5	X	0.8	8	70	6	4.9	4.2	TM29170500
M 6	X	1.0	10	80	6	4.9	5	TM29170600
M 8	X	1.25	13	90	8	6.2	6.8	TM29170800
M 10	X	1.5	15	100	10	8	8.5	TM29171000
M 12	X	1.75	18	110	9	7	10.2	TM30171200
M 14	X	2.0	20	110	11	9	12	TM30171400
M 16	X	2.0	20	110	12	9	14	TM30171600
M 20	X	2.5	25	140	16	12	17.5	TM30172000

▶ DIN 371(M3-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H		M		K		S		N				O	
11	12	15	16	21	22	31	32	41	42	61	62	63	64	81	82
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13	14	16	17	23	24	33	34	51	52	71	72	73	74	83	
	○			○					○						

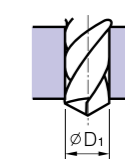
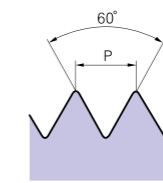
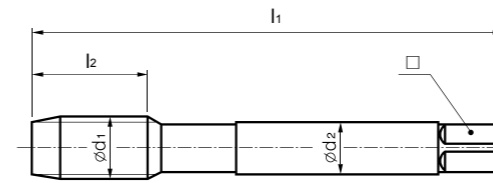
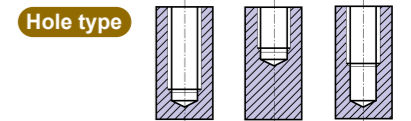
M METRIC COARSE THREADS



Series No. TM2817

▶ cutting conditions : p.87

Spiral flute.
High tensile steels >1200N/mm² and hardened materials.
TiN coated for increased tool life.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM28170200
M 3	X	0.5	6	56	3.5	2.7	2.5	TM28170300
M 4	X	0.7	7	63	4.5	3.4	3.3	TM28170400
M 5	X	0.8	8	70	6	4.9	4.2	TM28170500
M 6	X	1.0	10	80	6	4.9	5	TM28170600
M 8	X	1.25	13	90	8	6.2	6.8	TM28170800
M 10	X	1.5	15	100	10	8	8.5	TM28171000
M 12	X	1.75	18	110	9	7	10.2	TM28171200
M 14	X	2.0	20	110	11	9	12	TM28171400
M 16	X	2.0	20	110	12	9	14	TM28171600
M 20	X	2.5	25	140	16	12	17.5	TM28172000

▶ DIN 371(M2-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H		M		K		S		N				O	
11	12	15	16	21	22	31	32	41	42	61	62	63	64	81	82
		●							○						
13	14	16	17	23	24	33	34	51	52	71	72	73	74	83	
	○			○					○						

M METRIC COARSE THREADS



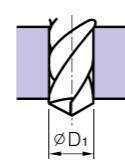
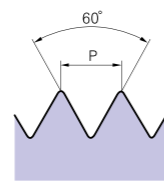
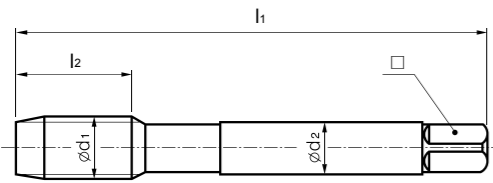
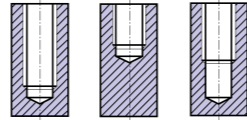
Series No. TM2130, TM2230

▶ cutting conditions : p.87

Spiral flute
Recessed threads for tapping deep holes.
High tensile steels <1200N/mm² and hardened materials



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 3	X	0.5	6	56	3.5	2.7	2.5	TM21300300
M 4	X	0.7	7	63	4.5	3.4	3.3	TM21300400
M 5	X	0.8	8	70	6	4.9	4.2	TM21300500
M 6	X	1.0	10	80	6	4.9	5	TM21300600
M 8	X	1.25	13	90	8	6.2	6.8	TM21300800
M 10	X	1.5	15	100	10	8	8.5	TM21301000
M 12	X	1.75	18	110	9	7	10.2	TM22301200
M 14	X	2.0	20	110	11	9	12	TM22301400
M 16	X	2.0	20	110	12	9	14	TM22301600
M 18	X	2.5	25	125	14	11	15.5	TM22301800
M 20	X	2.5	25	140	16	12	17.5	TM22302000

▶ DIN 371(M3-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H		M		K		S		N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
		●						○							
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
	○		○					○							

M METRIC COARSE THREADS



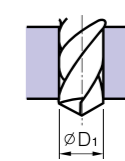
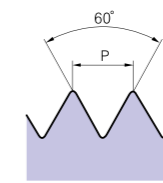
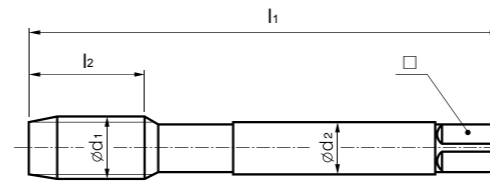
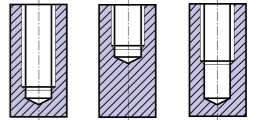
Series No. TM1530, TM1630

▶ cutting conditions : p.87

Spiral flute.
High tensile steels <1200N/mm² and hardened materials.



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM15300200
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM15300250
M 3	X	0.5	6	56	3.5	2.7	2.5	TM15300300
M 4	X	0.7	7	63	4.5	3.4	3.3	TM15300400
M 5	X	0.8	8	70	6	4.9	4.2	TM15300500
M 6	X	1.0	10	80	6	4.9	5	TM15300600
M 8	X	1.25	13	90	8	6.2	6.8	TM15300800
M 10	X	1.5	15	100	10	8	8.5	TM15301000
M 12	X	1.75	18	110	9	7	10.2	TM16301200
M 14	X	2.0	20	110	11	9	12	TM16301400
M 16	X	2.0	20	110	12	9	14	TM16301600
M 18	X	2.5	25	125	14	11	15.5	TM16301800
M 20	X	2.5	25	140	16	12	17.5	TM16302000
M 24	X	3.0	30	160	18	14.5	21	TM16302400
M 27	X	3.0	30	160	20	16	24	TM16302700
M 30	X	3.5	35	180	22	18	26.5	TM16303000

▶ DIN 371(M2-M10) DIN 376(M12-M30)

●: Excellent ○: Good

P		H		M		K		S		N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
		●						○							
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
	○		○					○							

M METRIC COARSE THREADS



HSS-E DIN 352 6H 60° B Bright

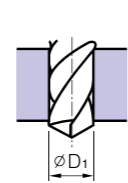
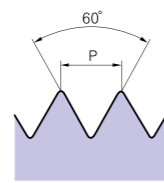
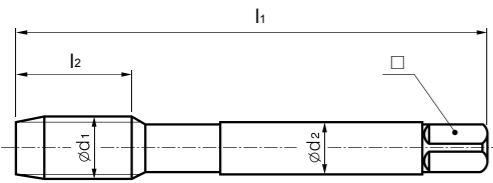
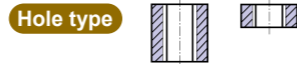


DIN 352

Series No. TM0116

▶ cutting conditions : p.86

Spiral point.
Thick web for higher cutting speed.
Short machine taps for automatic lathes.
General steels <750N/mm².



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	36	2.8	2.1	1.6	TM01160200
M 2.5	X	0.45	9	40	2.8	2.1	2.05	TM01160250
M 3	X	0.5	11	40	3.5	2.7	2.5	TM01160300
M 4	X	0.7	13	45	4.5	3.4	3.3	TM01160400
M 5	X	0.8	16	52	6	4.9	4.2	TM01160500
M 6	X	1.0	18	56	6	4.9	5	TM01160600
M 8	X	1.25	20	63	6	4.9	6.8	TM01160800
M 10	X	1.5	22	70	7	5.5	8.5	TM01161000
M 12	X	1.75	24	80	9	7	10.2	TM01161200
M 14	X	2.0	26	80	11	9	12	TM01161400
M 16	X	2.0	27	80	12	9	14	TM01161600

▶ DIN 352 (M2-M16)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

M METRIC COARSE THREADS



HSS-E DIN 352 6H 60° C Bright R20

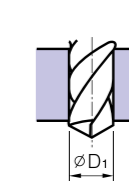
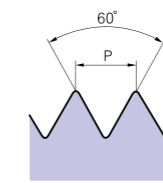
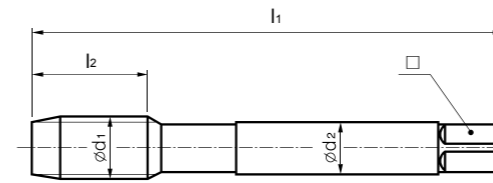
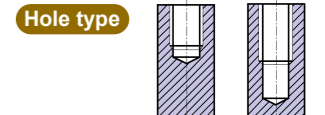


DIN 352

Series No. TM0216

▶ cutting conditions : p.87

Spiral flute.
Short machine taps for automatic lathes.
General steels <750N/mm².



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 3	X	0.5	11	40	3.5	2.7	2.5	TM02160300
M 4	X	0.7	13	45	4.5	3.4	3.3	TM02160400
M 5	X	0.8	16	52	6	4.9	4.2	TM02160500
M 6	X	1.0	18	56	6	4.9	5	TM02160600
M 8	X	1.25	20	63	6	4.9	6.8	TM02160800
M 10	X	1.5	22	70	7	5.5	8.5	TM02161000
M 12	X	1.75	24	80	9	7	10.2	TM02161200
M 14	X	2.0	26	80	11	9	12	TM02161400
M 16	X	2.0	27	80	12	9	14	TM02161600
M 18	X	2.5	30	95	14	11	15.5	TM02161800
M 20	X	2.5	32	95	16	12	17.5	TM02162000

▶ DIN 352 (M3-M20)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

M METRIC COARSE THREADS



HSS-E DIN 371 6H 60° B Bright



DIN 371

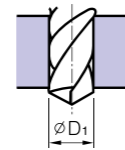
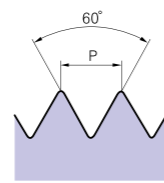
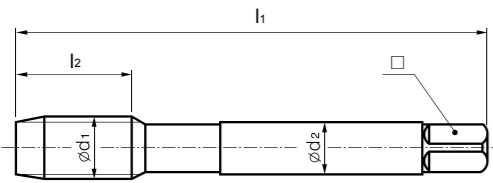
Series No. TM0316

▶ cutting conditions : p.86

Spiral point.
Thick web for higher cutting speed.
General steels <750N/mm².

Material groups **GS**

Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM03160200
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM03160250
M 3	X	0.5	11	56	3.5	2.7	2.5	TM03160300
M 3.5	X	0.6	12	56	4	3	2.9	TM03160350
M 4	X	0.7	13	63	4.5	3.4	3.3	TM03160400
M 4.5	X	0.75	14	70	6	4.9	3.7	TM03160450
M 5	X	0.8	15	70	6	4.9	4.2	TM03160500
M 6	X	1.0	17	80	6	4.9	5	TM03160600
M 7	X	1.0	17	80	7	5.5	6	TM03160700
M 8	X	1.25	20	90	8	6.2	6.8	TM03160800
M 10	X	1.5	22	100	10	8	8.5	TM03161000
M 12	X	1.75	24	110	12	9	10.2	TM03161200

▶ DIN 371 (M2-M12)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

M METRIC COARSE THREADS



HSS-E DIN 371/376 6H 60° C Bright R20



DIN 371



DIN 376

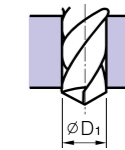
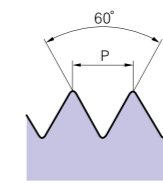
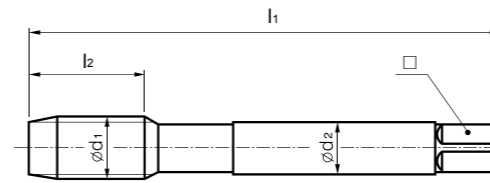
Series No. TM1316, TM1416

▶ cutting conditions : p.87

Spiral flute.
20° spiral for good chip evacuation.
General steels <750N/mm².

Material groups **GS**

Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM13160200
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM13160250
M 3	X	0.5	6	56	3.5	2.7	2.5	TM13160300
M 4	X	0.7	7	63	4.5	3.4	3.3	TM13160400
M 5	X	0.8	8	70	6	4.9	4.2	TM13160500
M 6	X	1.0	10	80	6	4.9	5	TM13160600
M 8	X	1.25	13	90	8	6.2	6.8	TM13160800
M 10	X	1.5	15	100	10	8	8.5	TM13161000
M 12	X	1.75	18	110	9	7	10.2	TM14161200
M 14	X	2.0	20	110	11	9	12	TM14161400
M 16	X	2.0	20	110	12	9	14	TM14161600
M 20	X	2.5	25	140	16	12	17.5	TM14162000

▶ DIN 371(M2-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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M METRIC COARSE THREADS



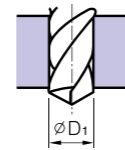
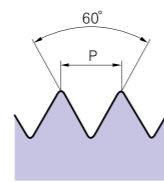
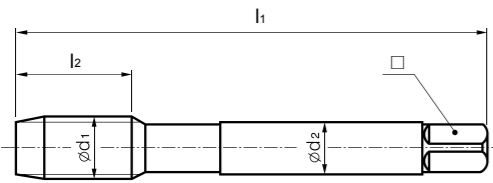
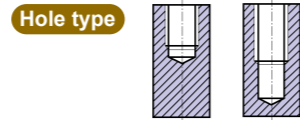
Series No. TM0416



DIN 376

▶ cutting conditions : p.87

Spiral point.
Thick web for higher cutting speed.
General steels <750N/mm².



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 3	X	0.5	11	56	2.2	1.8	2.5	TM04160300
M 4	X	0.7	13	63	2.8	2.1	3.3	TM04160400
M 5	X	0.8	15	70	3.5	2.7	4.2	TM04160500
M 6	X	1.0	17	80	4.5	3.4	5	TM04160600
M 8	X	1.25	20	90	6	4.9	6.8	TM04160800
M 10	X	1.5	22	100	7	5.5	8.5	TM04161000
M 12	X	1.75	24	110	9	7	10.2	TM04161200
M 14	X	2.0	26	110	11	9	12	TM04161400
M 16	X	2.0	27	110	12	9	14	TM04161600
M 18	X	2.5	30	125	14	11	15.5	TM04161800
M 20	X	2.5	32	140	16	12	17.5	TM04162000
M 22	X	2.5	32	140	18	14.5	19.5	TM04162200
M 24	X	3.0	34	160	18	14.5	21	TM04162400
M 27	X	3.0	36	160	20	16	24	TM04162700

▶ DIN 376 (M3-M27)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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M METRIC COARSE THREADS



Series No. TM1716



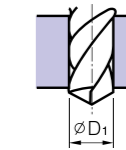
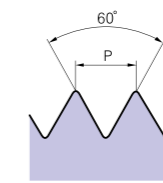
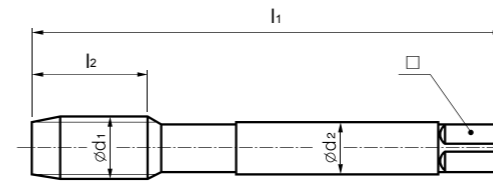
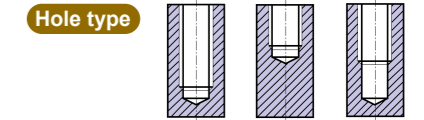
DIN 371



DIN 376

▶ cutting conditions : p.86

Spiral flute.
General steels <750N/mm².



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	5	45	2.8	2.1	1.6	TM17160200
M 3	X	0.5	6	56	3.5	2.7	2.5	TM17160300
M 4	X	0.7	7	63	4.5	3.4	3.3	TM17160400
M 5	X	0.8	8	70	6	4.9	4.2	TM17160500
M 6	X	1.0	10	80	6	4.9	5	TM17160600
M 8	X	1.25	13	90	8	6.2	6.8	TM17160800
M 10	X	1.5	15	100	10	8	8.5	TM17161000
M 12	X	1.75	18	110	9	7	10.2	TM17161200
M 14	X	2.0	20	110	11	9	12	TM17161400
M 16	X	2.0	20	110	12	9	14	TM17161600
M 18	X	2.5	25	125	14	11	15.5	TM17161800
M 20	X	2.5	25	140	16	12	17.5	TM17162000

▶ DIN 371(M2-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

M METRIC COARSE THREADS



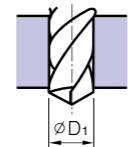
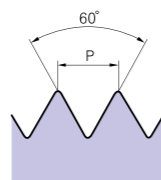
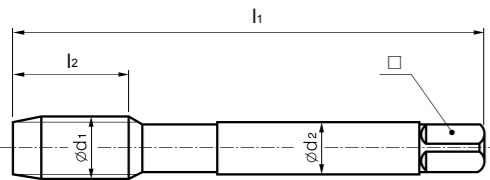
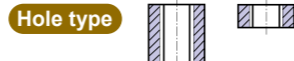
Series No. TM1817



DIN 371

▶ cutting conditions : p.87

Spiral point.
Thick web for higher cutting speed.
General steels 900-1000N/mm².
TiN coated for increased tool life.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM18170200
M 3	X	0.5	11	56	3.5	2.7	2.5	TM18170300
M 4	X	0.7	13	63	4.5	3.4	3.3	TM18170400
M 5	X	0.8	15	70	6	4.9	4.2	TM18170500
M 6	X	1.0	17	80	6	4.9	5	TM18170600
M 8	X	1.25	20	90	8	6.2	6.8	TM18170800
M 10	X	1.5	22	100	10	8	8.5	TM18171000
M 12	X	1.75	24	110	12	9	10.2	TM18171200

▶ DIN 371(M2-M12)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

M METRIC COARSE THREADS



Series No. TM1917, TM2017



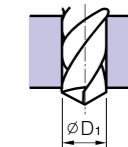
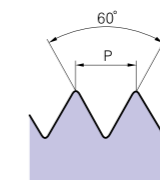
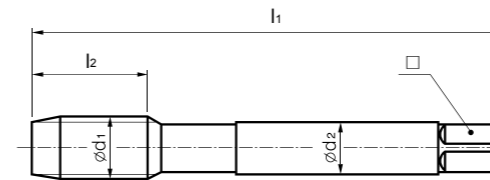
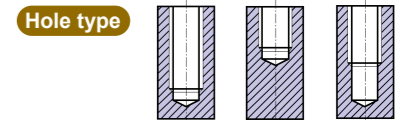
DIN 371



DIN 376

▶ cutting conditions : p.87

Spiral flute.
General steels 900-1000N/mm².
TiN coated for increased tool life.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM19170200
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM19170250
M 3	X	0.5	6	56	3.5	2.7	2.5	TM19170300
M 4	X	0.7	7	63	4.5	3.4	3.3	TM19170400
M 5	X	0.8	8	70	6	4.9	4.2	TM19170500
M 6	X	1.0	10	80	6	4.9	5	TM19170600
M 8	X	1.25	13	90	8	6.2	6.8	TM19170800
M 10	X	1.5	15	100	10	8	8.5	TM19171000
M 12	X	1.75	18	110	9	7	10.2	TM20171200
M 14	X	2.0	20	110	11	9	12	TM20171400
M 16	X	2.0	20	110	12	9	14	TM20171600
M 18	X	2.5	25	125	14	11	15.5	TM20171800
M 20	X	2.5	25	140	16	12	17.5	TM20172000
M 22	X	2.5	25	140	18	14.5	19.5	TM20172200
M 24	X	3.0	30	160	18	14.5	21	TM20172400
M 27	X	3.0	30	160	20	16	24	TM20172700
M 30	X	3.5	35	180	22	18	26.5	TM20173000

▶ DIN 371(M2-M10) DIN 376(M12-M30)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

MF METRIC FINE THREADS



HSS-E DIN 374 6H 60° B Bright



DIN 374

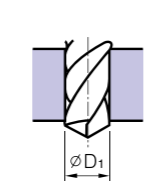
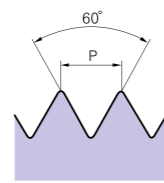
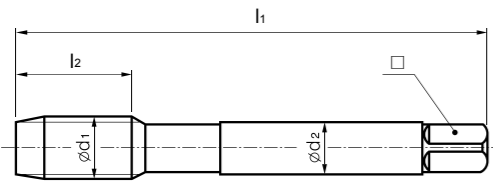
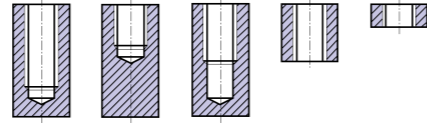
Series No. TM3316

▶ cutting conditions : p.86

Spiral point.
Thick web for higher cutting speed.
General steels <750N/mm².



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 4	X	0.5	10	63	2.8	2.1	3.5	TM33160400
M 5	X	0.5	11	70	3.5	2.7	4.5	TM33160500
M 6	X	0.5	13	80	4.5	3.4	5.5	TM33160600
M 6	X	0.75	13	80	4.5	3.4	5.2	TM33160601
M 8	X	0.5	14	80	6	4.9	7.5	TM33160800
M 8	X	0.75	14	80	6	4.9	7.2	TM33160801
M 8	X	1.0	17	90	6	4.9	7	TM33160802
M 10	X	1.75	18	90	7	5.5	9.2	TM33161000
M 10	X	1.0	18	90	7	5.5	9	TM33161001
M 10	X	1.25	22	100	7	5.5	8.8	TM33161002
M 12	X	1.0	18	100	9	7	11	TM33161200
M 12	X	1.25	22	100	9	7	10.8	TM33161201
M 12	X	1.5	22	100	9	7	10.5	TM33161202
M 14	X	1.0	18	100	11	9	13	TM33161400
M 14	X	1.25	22	100	11	9	12.8	TM33161401
M 14	X	1.5	22	100	11	9	12.5	TM33161402
M 16	X	1.0	18	100	12	9	15	TM33161600
M 16	X	1.5	22	100	12	9	14.5	TM33161601
M 18	X	1.0	20	110	14	11	17	TM33161800
M 18	X	1.5	25	110	14	11	16.5	TM33161801

▶ DIN 374(M4-M30)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

MF METRIC FINE THREADS



HSS-E DIN 374 6H 60° B Bright



DIN 374

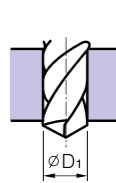
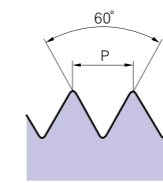
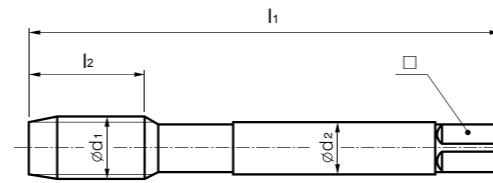
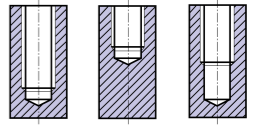
Series No. TM3316

▶ cutting conditions : p.86

Spiral point.
Thick web for higher cutting speed.
General steels <750N/mm².



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 20	X	1.0	20	125	16	12	19	TM33162000
M 20	X	1.5	25	125	16	12	18.5	TM33162001
M 22	X	1.0	20	125	18	14.5	21	TM33162200
M 22	X	1.5	25	125	18	14.5	20.5	TM33162201
M 24	X	1.5	27	140	18	14.5	22.5	TM33162400
M 24	X	2.0	27	140	18	14.5	22	TM33162401
M 26	X	1.5	28	140	18	14.5	24.5	TM33162600
M 27	X	1.5	28	140	20	16	25.5	TM33162700
M 27	X	2.0	28	140	20	16	25	TM33162701
M 28	X	1.5	28	140	20	16	26.5	TM33162800
M 30	X	1.5	30	150	22	18	28.5	TM33163000
M 30	X	2.0	30	150	22	18	28	TM33163001

▶ DIN 374(M4-M30)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

MF METRIC FINE THREADS



DIN 374

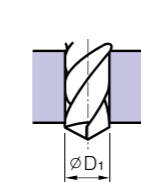
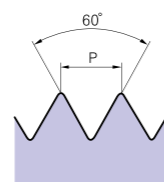
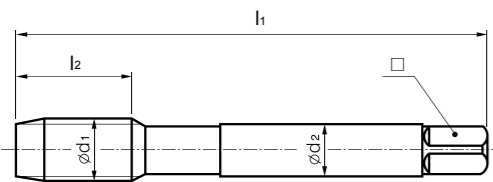
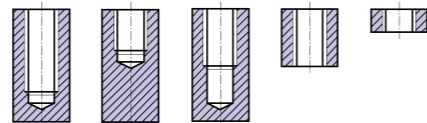
Series No. TM3416

▶ cutting conditions : p.86

Spiral flute.
General steels <750N/mm².



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 4	X	0.5	10	63	2.8	2.1	3.5	TM34160400
M 5	X	0.5	11	70	3.5	2.7	4.5	TM34160500
M 6	X	0.5	13	80	4.5	3.4	5.5	TM34160600
M 6	X	0.75	13	80	4.5	3.4	5.2	TM34160601
M 8	X	0.5	14	80	6	4.9	7.5	TM34160800
M 8	X	0.75	14	80	6	4.9	7.2	TM34160801
M 8	X	1.0	17	90	6	4.9	7	TM34160802
M 10	X	1.75	18	90	7	5.5	9.2	TM34161000
M 10	X	1.0	18	90	7	5.5	9	TM34161001
M 10	X	1.25	22	100	7	5.5	8.8	TM34161002
M 12	X	1.0	18	100	9	7	11	TM34161200
M 12	X	1.25	22	100	9	7	10.8	TM34161201
M 12	X	1.5	22	100	9	7	10.5	TM34161202
M 14	X	1.0	18	100	11	9	13	TM34161400
M 14	X	1.25	22	100	11	9	12.8	TM34161401
M 14	X	1.5	22	100	11	9	12.5	TM34161402
M 16	X	1.0	18	100	12	9	15	TM34161600
M 16	X	1.5	22	100	12	9	14.5	TM34161601
M 18	X	1.0	20	110	14	11	17	TM34161800
M 18	X	1.5	25	110	14	11	16.5	TM34161801

▶ DIN 374(M4-M30)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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MF METRIC FINE THREADS



DIN 374

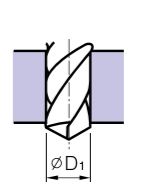
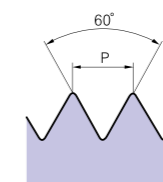
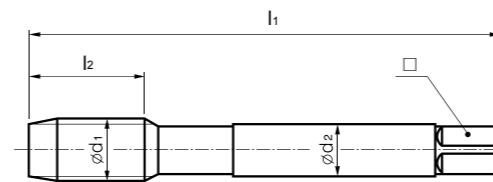
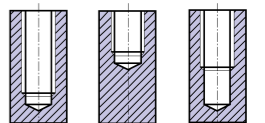
Series No. TM3416

▶ cutting conditions : p.86

Spiral flute.
General steels <750N/mm².



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 20	X	1.0	14	125	16	12	19	TM34162000
M 20	X	1.5	17	125	16	12	18.5	TM34162001
M 22	X	1.0	14	125	18	14.5	21	TM34162200
M 22	X	1.5	17	125	18	14.5	20.5	TM34162201
M 24	X	1.5	20	140	18	14.5	22.5	TM34162400
M 24	X	2.0	20	140	18	14.5	22	TM34162401
M 26	X	1.5	20	140	18	14.5	24.5	TM34162600
M 27	X	1.5	20	140	20	16	25.5	TM34162700
M 27	X	2.0	20	140	20	16	25	TM34162701
M 28	X	1.5	20	140	20	16	26.5	TM34162800
M 30	X	1.5	22	150	22	18	28.5	TM34163000
M 30	X	2.0	22	150	22	18	28	TM34163001

▶ DIN 374(M4-M30)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

UNC UNIFIED COARSE THREADS



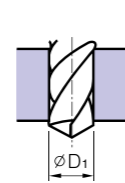
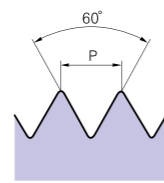
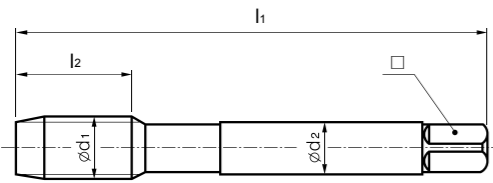
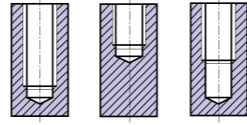
Series No. TM6516

▶ cutting conditions : p.86

Spiral flute.
General steels <750N/mm².



Hole type



Ød ₁ inch	X	P inch	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
No.4	X	40	6	56	3.5	2.7	2.3	TM65160400
No.5	X	40	7	56	3.5	2.7	2.6	TM65160500
No.6	X	32	7	56	4	3	2.85	TM65160600
No.8	X	32	8	63	4.5	3.4	3.5	TM65160800
No.10	X	24	10	70	6	4.9	3.9	TM65161000
No.12	X	24	10	80	6	4.9	4.5	TM65161200
1/4	X	20	13	80	7	5.5	5.2	TM65169160
5/16	X	18	14	90	8	6.2	6.6	TM65169200
3/8	X	16	16	100	9	7	8	TM65169240
7/16	X	14	17	100	8	6.2	9.4	TM65169280
1/2	X	13	20	110	9	7	10.75	TM65169320
9/16	X	12	20	110	11	9	12.25	TM65169360
5/8	X	11	22	110	12	9	13.5	TM65169400
3/4	X	10	25	125	14	11	16.5	TM65169480
7/8	X	9	27	140	18	14.5	19.5	TM65169560
1"	X	8	30	160	20	16	22.25	TM65169640

▶ DIN 371(No.4-3/8") DIN376(7/16"-1")

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

UNC UNIFIED COARSE THREADS



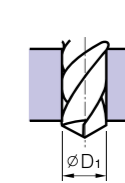
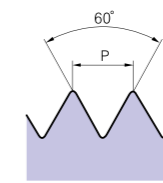
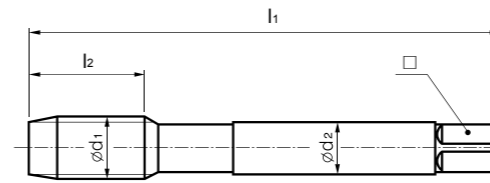
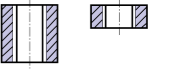
Series No. TM6416

▶ cutting conditions : p.86

Spiral point.
Thick web for higher cutting speed.
General steels <750N/mm².



Hole type



Ød ₁ inch	X	P inch	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
No.4	X	40	11	56	3.5	2.7	2.3	TM64160400
No.5	X	40	11	56	3.5	2.7	2.6	TM64160500
No.6	X	32	12	56	4	3	2.85	TM64160600
No.8	X	32	13	63	4.5	3.4	3.5	TM64160800
No.10	X	24	15	70	6	4.9	3.9	TM64161000
No.12	X	24	16	80	6	4.9	4.5	TM64161200
1/4	X	20	17	80	7	5.5	5.2	TM64169160
5/16	X	18	20	90	8	6.2	6.6	TM64169200
3/8	X	16	22	100	9	7	8	TM64169240
7/16	X	14	22	100	8	6.2	9.4	TM64169280
1/2	X	13	25	110	9	7	10.75	TM64169320
9/16	X	12	26	110	11	9	12.25	TM64169360
5/8	X	11	27	110	12	9	13.5	TM64169400
3/4	X	10	30	125	14	11	16.5	TM64169480
7/8	X	9	32	140	18	14.5	19.5	TM64169560
1"	X	8	36	160	20	16	22.25	TM64169640

▶ DIN 371(No.4-3/8") DIN376(7/16"-1")

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

UNF UNIFIED FINE THREADS



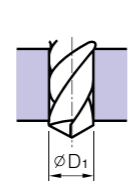
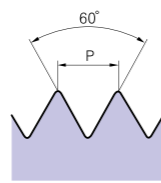
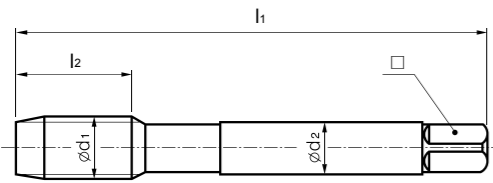
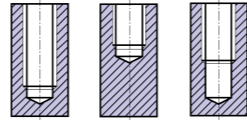
Series No. TM6816

▶ cutting conditions : p.86

Spiral flute.
General steels <750N/mm².



Hole type



Ød ₁ inch	X	P inch	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
No.4	X	48	6	56	3.5	2.7	2.4	TM68160400
No.5	X	44	7	56	3.5	2.7	2.7	TM68160500
No.6	X	40	7	56	4	3	3	TM68160600
No.8	X	36	8	63	4.5	3.4	3.5	TM68160800
No.10	X	32	10	70	6	4.9	4.1	TM68161000
No.12	X	28	10	80	6	4.9	4.7	TM68161200
1/4	X	28	10	80	7	5.5	5.5	TM68169160
5/16	X	24	10	90	8	6.2	6.9	TM68169200
3/8	X	24	10	100	9	7	8.5	TM68169240
7/16	X	20	13	100	8	6.2	9.9	TM68169280
1/2	X	20	13	100	9	7	11.5	TM68169320
9/16	X	18	15	100	11	9	12.9	TM68169360
5/8	X	18	15	100	12	9	14.5	TM68169400
3/4	X	16	17	110	14	11	17.5	TM68169480
7/8	X	14	17	125	18	14.5	20.5	TM68169560
1"	X	12	20	140	20	16	23.25	TM68169640

▶ DIN 371(No.4-3/8") DIN374(7/16"-1")

●: Excellent ○: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
	●						○			○		●		○	
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
●	●				●	●	○			○	○	○	●		

UNF UNIFIED FINE THREADS



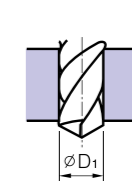
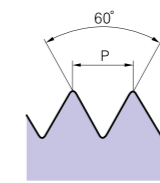
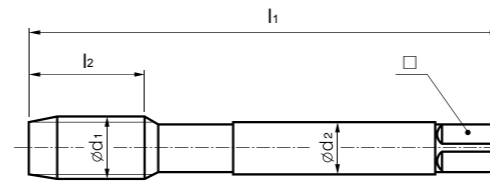
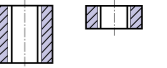
Series No. TM6716

▶ cutting conditions : p.86

Spiral point.
Thick web for higher cutting speed.
General steels <750N/mm².



Hole type



Ød ₁ inch	X	P inch	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
No.4	X	48	11	56	3.5	2.7	2.4	TM67160400
No.5	X	44	11	56	3.5	2.7	2.7	TM67160500
No.6	X	40	12	56	4	3	3	TM67160600
No.8	X	36	13	63	4.5	3.4	3.5	TM67160800
No.10	X	32	13	70	6	4.9	4.1	TM67161000
No.12	X	28	16	80	6	4.9	4.7	TM67161200
1/4	X	28	17	80	7	5.5	5.5	TM67169160
5/16	X	24	17	90	8	6.2	6.9	TM67169200
3/8	X	24	18	100	9	7	8.5	TM67169240
7/16	X	20	22	100	8	6.2	9.9	TM67169280
1/2	X	20	22	100	9	7	11.5	TM67169320
9/16	X	18	22	100	11	9	12.9	TM67169360
5/8	X	18	22	100	12	9	14.5	TM67169400
3/4	X	16	25	110	14	11	17.5	TM67169480
7/8	X	14	26	125	18	14.5	20.5	TM67169560
1"	X	12	28	140	20	16	23.25	TM67169640

▶ DIN 371(No.4-3/8") DIN374(7/16"-1")

●: Excellent ○: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
	●						○			○		●		○	
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
●	●				●	●	○			○	○	○	●		

BSP WHITWORTH PIPE THREADS



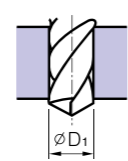
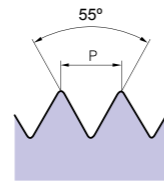
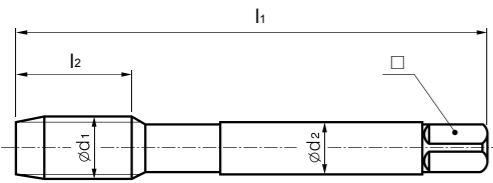
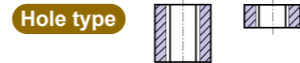
Series No. TB0116



DIN 5156

▶ cutting conditions : p.86

Spiral point.
Thick web for higher cutting speed.
General steels <750N/mm².



Ød ₁ inch	X	P inch	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
1/8	X	28	18	90	7	5.5	8.8	TB01160080
1/4	X	19	22	100	11	9	11.8	TB01160160
3/8	X	19	22	100	12	9	15.25	TB01160240
1/2	X	14	25	125	16	12	19	TB01160320
3/4	X	14	28	140	20	16	24.5	TB01160480
1"	X	11	32	160	25	20	30.75	TB01160640

▶ DIN 5156

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

BSP WHITWORTH PIPE THREADS



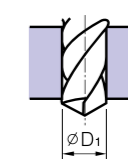
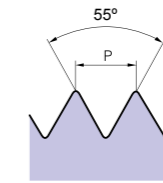
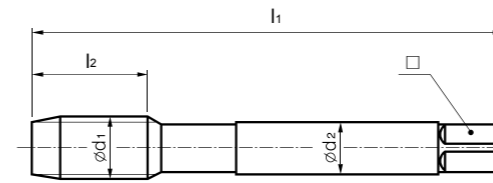
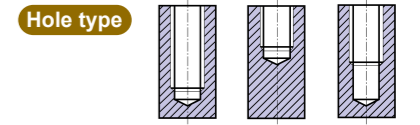
Series No. TB0216



DIN 5156

▶ cutting conditions : p.86

Spiral flute.
General steels <750N/mm².



Ød ₁ inch	X	P inch	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
1/8	X	28	10	90	7	5.5	8.8	TB02160080
1/4	X	19	14	100	11	9	11.8	TB02160160
3/8	X	19	15	100	12	9	15.25	TB02160240
1/2	X	14	17	125	16	12	19	TB02160320
3/4	X	14	20	140	20	16	24.5	TB02160480
1"	X	11	24	160	25	20	30.75	TB02160640

▶ DIN 5156

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
	●						○			○		●		○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
●	●				●	●	○			○	○	○	●			

M METRIC COARSE THREADS



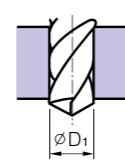
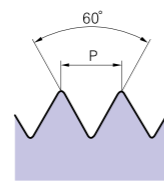
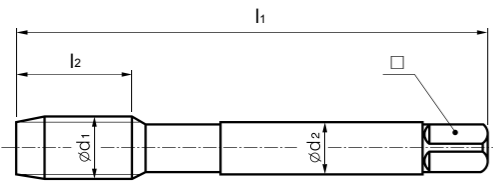
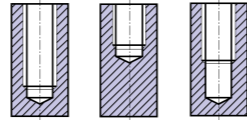
Series No. TM7210

▶ cutting conditions : p.89

Spiral flute.
Titanium, Nickel alloys and hard materials.



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM72100200
M 2.2	X	0.45	8	45	2.8	2.1	1.75	TM72100220
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM72100250
M 3	X	0.5	6	56	3.5	2.7	2.5	TM72100300
M 3.5	X	0.6	7	56	4	3	2.9	TM72100350
M 4	X	0.7	7	63	4.5	3.4	3.3	TM72100400
M 4.5	X	0.75	8	70	6	4.9	3.7	TM72100450
M 5	X	0.8	8	70	6	4.9	4.2	TM72100500
M 6	X	1.0	10	80	6	4.9	5	TM72100600
M 7	X	1.0	10	80	7	5.5	6	TM72100700
M 8	X	1.25	13	90	8	6.2	6.8	TM72100800
M 10	X	1.5	15	100	10	8	8.5	TM72101000
M 12	X	1.75	18	110	9	7	10.2	TM72101200

▶ DIN 371(M2-M10) DIN 376(M12)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
		●					○	●	●					○		
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
		●						●	●							

M METRIC COARSE THREADS



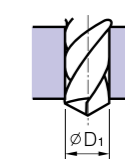
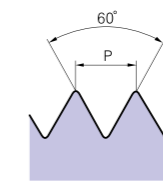
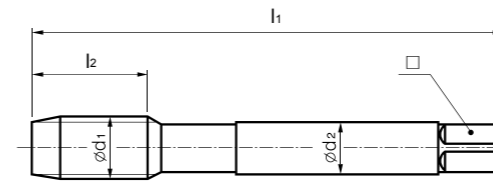
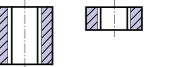
Series No. TM7110

▶ cutting conditions : p.89

Spiral point.
Thick web for higher cutting speed.
Titanium, Nickel alloys and hard materials.



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM71100200
M 2.2	X	0.45	8	45	2.8	2.1	1.75	TM71100220
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM71100250
M 3	X	0.5	11	56	3.5	2.7	2.5	TM71100300
M 3.5	X	0.6	12	56	4	3	2.9	TM71100350
M 4	X	0.7	13	63	4.5	3.4	3.3	TM71100400
M 4.5	X	0.75	14	70	6	4.9	3.7	TM71100450
M 5	X	0.8	15	70	6	4.9	4.2	TM71100500
M 6	X	1.0	17	80	6	4.9	5	TM71100600
M 7	X	1.0	17	80	7	5.5	6	TM71100700
M 8	X	1.25	20	90	8	6.2	6.8	TM71100800
M 10	X	1.5	22	100	10	8	8.5	TM71101000
M 12	X	1.75	24	110	9	7	10.2	TM71101200

▶ DIN 371(M2-M10) DIN 376(M12)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
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13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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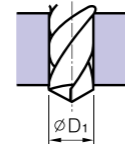
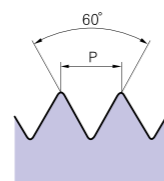
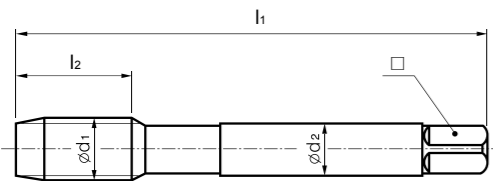
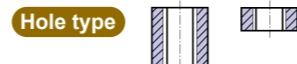
M METRIC COARSE THREADS



Series No. TM7328

▶ cutting conditions : p.89

Spiral point.
Thick web for higher cutting speed.
Nickel alloys and hard materials.
TiAlN coated for increased tool life.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM73280200
M 2.2	X	0.45	8	45	2.8	2.1	1.75	TM73280220
M 2.3	X	0.4	8	45	2.8	2.1	1.9	TM73280230
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM73280250
M 2.6	X	0.45	9	50	2.8	2.1	2.1	TM73280260
M 3	X	0.5	11	56	3.5	2.7	2.5	TM73280300
M 3.5	X	0.6	12	56	4	3	2.9	TM73280350
M 4	X	0.7	13	63	4.5	3.4	3.3	TM73280400
M 4.5	X	0.75	14	70	6	4.9	3.7	TM73280450
M 5	X	0.8	15	70	6	4.9	4.2	TM73280500
M 6	X	1.0	17	80	6	4.9	5	TM73280600
M 7	X	1.0	17	80	7	5.5	6	TM73280700
M 8	X	1.25	20	90	8	6.2	6.8	TM73280800
M 9	X	1.25	20	90	9	7	7.8	TM73280900
M 10	X	1.5	22	100	10	8	8.5	TM73281000

▶ DIN 371(M2-M10) DIN 376(M11-M30)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
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13	14	16	23		33	34	51	52	53	71	72	73	74	83		
		●						●	●							

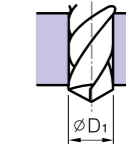
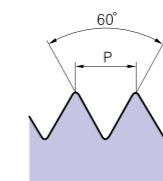
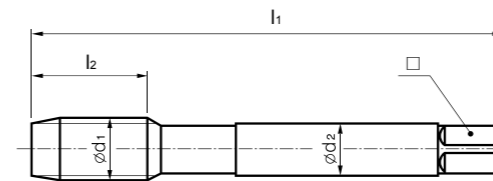
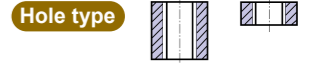
M METRIC COARSE THREADS



Series No. TM7328

▶ cutting conditions : p.89

Spiral point.
Thick web for higher cutting speed.
Nickel alloys and hard materials.
TiAlN coated for increased tool life.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 11	X	1.5	22	100	8	6.2	9.5	TM73281100
M 12	X	1.75	24	110	9	7	10.2	TM73281200
M 14	X	2.0	26	110	11	9	12	TM73281400
M 16	X	2.0	27	110	12	9	14	TM73281600
M 18	X	2.5	30	125	14	11	15.5	TM73281800
M 20	X	2.5	32	140	16	12	17.5	TM73282000
M 22	X	2.5	32	140	18	14.5	19.5	TM73282200
M 24	X	3.0	34	160	18	14.5	21	TM73282400
M 27	X	3.0	36	160	20	16	24	TM73282700
M 30	X	3.5	40	180	22	18	26.5	TM73283000

▶ DIN 371(M2-M10) DIN 376(M11-M30)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
		●							○				○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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M METRIC COARSE THREADS



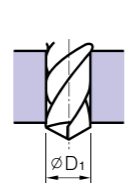
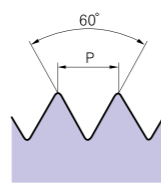
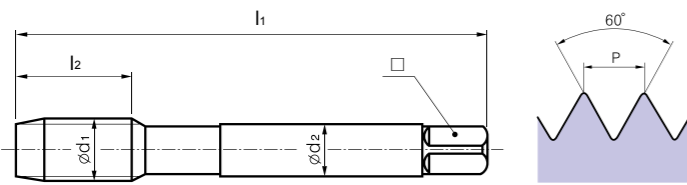
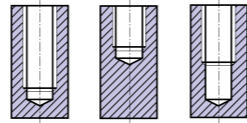
Series No. TM7428

▶ cutting conditions : p.89

Spiral flute.
Nickel alloys and hard materials.
TiAlN coated for increased tool life.



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM74280200
M 2.2	X	0.45	8	45	2.8	2.1	1.75	TM74280220
M 2.3	X	0.4	8	45	2.8	2.1	1.9	TM74280230
M 2.5	X	0.45	9	50	2.8	2.1	2.05	TM74280250
M 2.6	X	0.45	9	50	2.8	2.1	2.1	TM74280260
M 3	X	0.5	6	56	3.5	2.7	2.5	TM74280300
M 3.5	X	0.6	7	56	4	3	2.9	TM74280350
M 4	X	0.7	7	63	4.5	3.4	3.3	TM74280400
M 4.5	X	0.75	8	70	6	4.9	3.7	TM74280450
M 5	X	0.8	8	70	6	4.9	4.2	TM74280500
M 6	X	1.0	10	80	6	4.9	5	TM74280600
M 7	X	1.0	10	80	7	5.5	6	TM74280700
M 8	X	1.25	13	90	8	6.2	6.8	TM74280800
M 9	X	1.25	13	90	9	7	7.8	TM74280900
M 10	X	1.5	15	100	10	8	8.5	TM74281000

▶ DIN 371(M2-M10) DIN 376(M11-M30)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
		●							○				○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
		●						●	●							

M METRIC COARSE THREADS



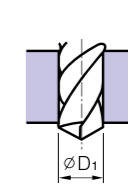
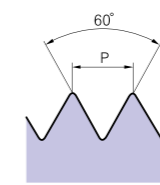
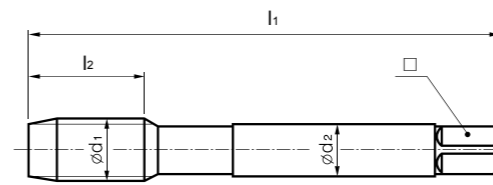
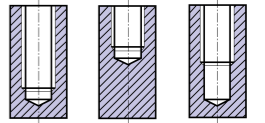
Series No. TM7428

▶ cutting conditions : p.89

Spiral flute.
Nickel alloys and hard materials.
TiAlN coated for increased tool life.



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 11	X	1.5	17	100	8	6.2	9.5	TM74281100
M 12	X	1.75	18	110	9	7	10.2	TM74281200
M 14	X	2.0	20	110	11	9	12	TM74281400
M 16	X	2.0	20	110	12	9	14	TM74281600
M 18	X	2.5	25	125	14	11	15.5	TM74281800
M 20	X	2.5	25	140	16	12	17.5	TM74282000
M 22	X	2.5	25	140	18	14.5	19.5	TM74282200
M 24	X	3.0	30	160	18	14.5	21	TM74282400
M 27	X	3.0	30	160	20	16	24	TM74282700
M 30	X	3.5	35	180	22	18	26.5	TM74283000

▶ DIN 371(M2-M10) DIN 376(M11-M30)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
		●							○				○			
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
		●						●	●							

M METRIC COARSE THREADS



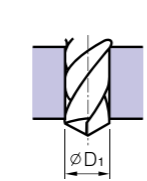
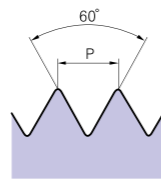
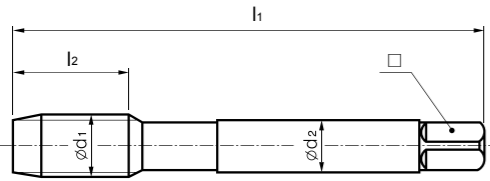
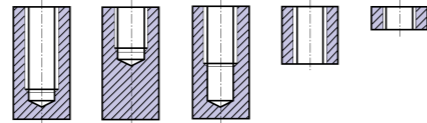
Series No. TM3827

▶ cutting conditions : p.87

Cold forming tap with oil grooves.
For materials with at least 10% elongation.
TiAlN coated for increased tool life.



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.83	TM38270200
M 2.5	X	0.45	9	50	2.8	2.1	2.3	TM38270250
M 3	X	0.5	11	56	3.5	2.7	2.8	TM38270300
M 4	X	0.7	13	63	4.5	3.4	3.7	TM38270400
M 5	X	0.8	15	70	6	4.9	4.65	TM38270500
M 6	X	1.0	17	80	6	4.9	5.55	TM38270600
M 8	X	1.25	20	90	8	6.2	7.4	TM38270800
M 10	X	1.5	22	100	10	8	9.3	TM38271000
M 12	X	1.75	24	110	9	7	11.2	TM38271200
M 14	X	2.0	26	110	11	9	13	TM38271400
M 16	X	2.0	27	110	12	9	15	TM38271600
M 20	X	2.5	32	140	16	12	18.8	TM38272000

▶ DIN 371(M2-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H			M		K			S				N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82				
●	●						●			●			○						
13	14	16	23		33	34	51	52	53	71	72	73	74	83					
●	●						●			●			○						

M METRIC COARSE THREADS



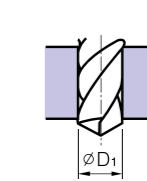
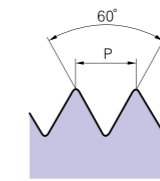
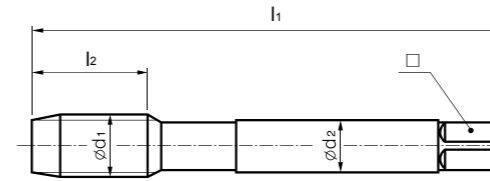
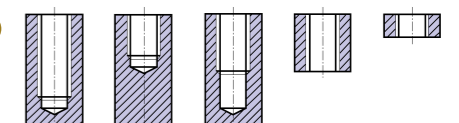
Series No. TM3817

▶ cutting conditions : p.87

Cold forming tap with oil grooves.
For materials with at least 10% elongation.
TiN coated for increased tool life.



Hole type



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.83	TM38170200
M 3	X	0.5	11	56	3.5	2.7	2.8	TM38170300
M 4	X	0.7	13	63	4.5	.4	3.7	TM38170400
M 5	X	0.8	15	70	6	4.9	4.65	TM38170500
M 6	X	1.0	17	80	6	4.9	5.55	TM38170600
M 8	X	1.25	20	90	8	6.2	7.4	TM38170800
M 10	X	1.5	22	100	10	8	9.3	TM38171000
M 12	X	1.75	24	110	9	7	11.2	TM38171200
M 14	X	2.0	26	110	11	9	13	TM38171400
M 16	X	2.0	27	110	12	9	15	TM38171600
M 20	X	2.5	32	140	16	12	18.8	TM38172000

▶ DIN 371(M2-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H			M		K			S				N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82				
●	●						●			●			○						
13	14	16	23		33	34	51	52	53	71	72	73	74	83					
●	●						●			●			○						

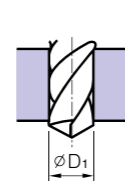
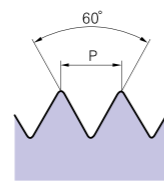
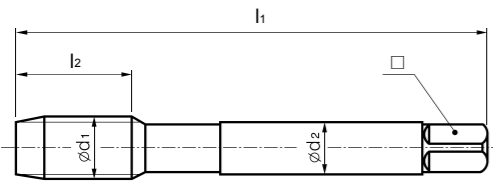
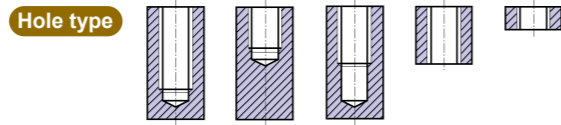
M METRIC COARSE THREADS



Series No. TM0731, TM0831

▶ cutting conditions : p.89

Straight flute.
Grey cast iron and fibre reinforced plastic.
Nitrited for increased wear resistance.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 3	X	0.5	11	56	3.5	2.7	2.5	TM07310300
M 4	X	0.7	13	63	4.5	3.4	3.3	TM07310400
M 5	X	0.8	15	70	6	4.9	4.2	TM07310500
M 6	X	1.0	17	80	6	4.9	5	TM07310600
M 7	X	1.0	17	80	7	5.5	6	TM07310700
M 8	X	1.25	20	90	8	6.2	6.8	TM07310800
M 10	X	1.5	22	100	10	8	8.5	TM07311000
M 12	X	1.75	24	110	9	7	10.2	TM08311200
M 14	X	2.0	26	110	11	9	12	TM08311400
M 16	X	2.0	27	110	12	9	14	TM08311600
M 18	X	2.5	30	125	14	11	15.5	TM08311800
M 20	X	2.5	32	140	16	12	17.5	TM08312000

▶ DIN 371(M3-M10) DIN 376(M12-M20)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
					●	●					○					
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
															●	

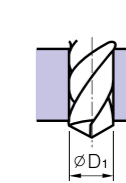
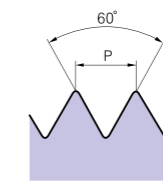
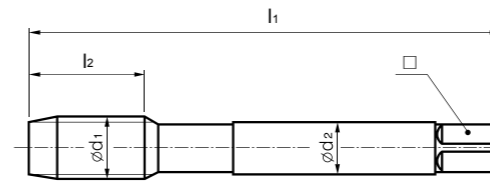
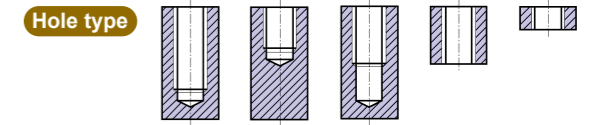
M METRIC COARSE THREADS



Series No. TM0917, TM1017

▶ cutting conditions : p.89

Straight flute.
Grey cast iron and fibre reinforced plastic.
TiN coated for increased tool life.



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 2	X	0.4	8	45	2.8	2.1	1.6	TM09170200
M 3	X	0.5	11	56	3.5	2.7	2.5	TM09170300
M 4	X	0.7	13	63	4.5	3.4	3.3	TM09170400
M 5	X	0.8	15	70	6	4.9	4.2	TM09170500
M 6	X	1.0	17	80	6	4.9	5	TM09170600
M 8	X	1.25	20	90	8	6.2	6.8	TM09170800
M 10	X	1.5	22	100	10	8	8.5	TM09171000
M 12	X	1.75	24	110	9	7	10.2	TM10171200
M 16	X	2.0	27	110	12	9	14	TM10171600

▶ DIN 371(M3-M10) DIN 376(M12-M16)

●: Excellent ○: Good

P		H		M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82	
					●	●					○					
13	14	16	23		33	34	51	52	53	71	72	73	74	83		
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M METRIC COARSE THREADS



HSS-E DIN 357 6H 60° LONG Bright

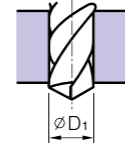
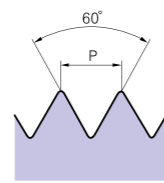
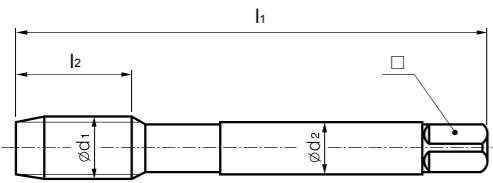
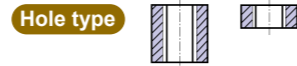


DIN 357

Series No. TM5016

► cutting conditions : p.87

Straight flute.
Nut tap.
General steels <750N/mm².



Ød ₁ mm	X	P mm	l ₂	l ₁	d ₂	sq	Tapping drill diameter	EUROPA CODE
M 4	X	0.7	25	90	2.8	2.1	3.3	TM50160400
M 5	X	0.8	28	100	3.5	2.7	4.2	TM50160500
M 6	X	1.0	32	110	4.5	3.4	5	TM50160600
M 8	X	1.25	40	125	6	4.9	6.8	TM50160800
M 10	X	1.5	45	140	7	5.5	8.5	TM50161000
M 12	X	1.75	50	180	9	7	10.2	TM50161200

► DIN 357(M4-M12)

●: Excellent ○: Good

P		H	M		K		S			N				O	
11	12	15	21	22	31	32	41	42	43	61	62	63	64	81	82
○	○										○	○		○	
13	14	16	23		33	34	51	52	53	71	72	73	74	83	
○	○				○	○								○	

APPLICATION TAPS CUTTING DATA

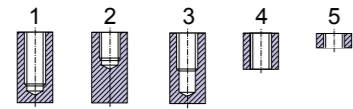


MACHINE TAPS CUTTING SPEEDS



Cutting data shown is for guidance and should be used as a starting point. Adjustments may be needed according to your set up.

HOLE TYPES:



TAP TYPE			GS	GS
DIN 371/376	M	Series No.	TM0316	TM1716
DIN 371/376	EG-M	Series No.		
DIN 352	M	Series No.	TM0116	
DIN 374	MF	Series No.	TM3316	TM3416
DIN 371/376	UNC	Series No.	TM6416	TM6516
DIN 371/376	EG-UNC	Series No.		
DIN 371/374	UNF	Series No.	TM6716	TM6816
DIN 371/376	EG-UNF	Series No.		
DIN 2182/2183	W(BSW)	Series No.		
DIN 357/5156	M/G(BSP)	Series No.	TB0116	TB0216
SURFACE TREATMENT / COATING				
SPIRAL FLUTE ANGLE				R40
CHAMFER LEAD ACC. DIN 2197			B	C
HOLE TYPE			4-5	1-2-3

COOLANT TYPES

- N - Neat Oil
- E - Emulsion
- N/E - Neat Oil or Emulsion
- D - Dry
- D/E - Dry or Emulsion



MATERIAL GROUP		HARDNESS HB	TENSILE STRENGTH N/mm ²	CHIP TYPE	COOLANT TYPE	V _c (m/min)	
P	11 Magnetic soft steels	< 120	< 400	Extra long	E		
	12 Structural steels, case carburizing steels	< 200	< 700	Medium/long	E	18	18
	13 Plain carbon steels	< 250	< 850	Long	E	15	15
	14 Alloy steels	< 250	< 850	Long	N/E	12	12
H	15 Alloy steels/Hardened & Tempered steels	< 350	< 1,200	Long	N/E		
	16 Alloy steels/Hardened & Tempered steels	> 350	> 1,200	Long	N		
M	21 Free machining stainless steel	< 250	< 850	Medium	N		
	22 Austenitic stainless steel	< 250	< 850	Long	N		
	23 Ferritic, Ferritic+Austenitic, Martensitic	< 300	< 1,000	Long	N		
K	31 Grey cast irons	< 150	< 500	Extra short	N/E		
	32 Grey cast irons	< 300	< 1,000	Extra short	E		
	33 Nodular graphite, Malleable cast irons	< 200	< 700	Short	N/E	12	12
	34 Nodular graphite, Malleable cast irons	< 300	< 1,000	Short	N/E	6	6
S	41 Titanium, unalloyed	< 200	< 700	Extra long	E	12	12
	42 Titanium, alloyed	< 270	< 900	Medium/Short	N		
	43 Titanium, alloyed	< 350	< 1,250	Medium/Short	N		
	51 Nickel, unalloyed	< 150	< 500	Extra long	N	10	10
	52 Nickel, alloyed	< 270	< 900	Long	N		
	53 Nickel, alloyed	< 350	< 1,250	Long	N		
N	61 Copper, unalloyed	< 100	< 350	Extra long	E	10	10
	62 Short chipping Brass, Bronze, Copper	< 200	< 700	Medium/Short	E		
	63 Long chipping Brass, Bronze, Copper	< 200	< 700	Long	E	15	15
	64 AMPCO (Cu-Al-Fe alloys)	< 470	< 1,500	Short	N		
	71 Aluminium, Magnesium, unalloyed	< 100	< 350	Extra long	E	10	10
72 Aluminium, alloyed Si < 0.5%	< 150	< 500	Medium	E	25	25	
73 Aluminium, alloyed, Si < 10%	< 120	< 400	Medium/Short	E	15	15	
74 Aluminium, alloyed, Si > 10%	< 120	< 400	Short	E	10	10	
O	81 Thermoplastics			Extra long	E	20	20
	82 Thermosetting Plastics			Short	D/E		
	83 Reinforced plastic materials			Extra short	D/E		

GS	GS	GS	GS	GS	HS	HS	HS	HS	HS	HS	HA	GV	GV
TM0416	TM1316	TM1817	TM1917		TM2716	TM6316	TM2917	TM2817	TM2130	TM1530	TM2330	TM3817	TM3827
	TM0216												
				TM5016									
		TiN	TiN			TiN	TiN	VAP	VAP	VAP	TiN	TiAlN	
	R20	R40	R40		R40		R40	R40	R40	R40	R40		
B	C	C	C	C/Long	B	C	B	C	C	C	C	C	C
4-5	2-3	1-2-3	1-2-3	1-2-3 4-5	4-5	1-2-3	4-5	1-2-3	1-2-3	1-2-3	1-2-3	1-2-3 4-5	1-2-3 4-5
V _c (m/min)													
				22								40	40
18	35	35	35	18								35	35
15	30	30	30	15								30	30
12	25	25	25	12	12	12	25	25	15	15		25	25
					8	8	15	15	12	12	12		
											5		
												15	
												12	
		10	10		4	4	10	10	6	6	6		
12	12	20	20	12									
6	6	10	10	6									
12	12	20	20									20	20
					10	10	20	20	18	18			
10	10											20	20
		20	20		10	10	20	20	12	12			
10	10	20	20									20	20
				25								30	
15	15	25	25	15								25	25
											5		
10	10	20	20									20	20
25	25	40	40										
15	15	25	25									25	25
10	10	20	20	10									
20	20	30	30										
											8		
											5		

SUPERIOR PERFORMANCE



ISO TAPS BLUE WIZARD/MERLIN

HAND & ISO TAPS



ISO standard shanks for general machine shop use.

Premium HSS substrate for extended tool life.

Steam vapour treated for increased wear resistance.

Blue Wizard - Spiral Point.
Blue Merlin - Spiral Flute.









IDEAL FOR MATERIAL GROUPS







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STRAIGHT FLUTE HAND TAPS & SETS

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	F021 G021		Metric Fine Bright M3 - M20	P.95
	F091 G091		UNC Bright No.1 - 1"	P.96
	F101 G101		UNF Bright No.0 - 1"	P.97
	F301 G301		BSPF Bright 1/8" - 1"	P.98
	F311 G311		BSPT Bright 1/8" - 1"	P.99

ISO SPIRAL POINT BLUE WIZARD

	F013		Metric Vap M1.6 - M20	P.100
	F023 F033		Metric Fine Vap M4 - M20	P.101
	F093		UNC Vap No.1 - 1"	P.102
	F103		UNF Vap No.0 - 1"	P.103

ISO SPIRAL FLUTE BLUE MERLIN

	F015		Metric Vap M3 - M20	P.104
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	F105		UNF Vap No.4 - 1"	P.107



METRIC COARSE HAND TAPS



HSS Bright ISO529 / BS949 6H

Series No. F011, G011



Size	Pitch	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	Z	EUROPA CODE			SET No. (3 TAPS)
								Taper Lead	Second Lead	Bottoming Lead	
M1.6	0.35	41	8.0	4	2.5	2.0	3	F0110063	F0110064	F0110065	G0110063
M2	0.40	41	9.5	4	2.5	2.0	3	F0110079	F0110080	F0110081	G0110079
M2.2	0.45	44.5	9.5	5	2.8	2.24	3	F0110087	F0110088	F0110089	G0110087
M2.5	0.45	44.5	9.5	5	2.8	2.24	3	F0110098	F0110099	F0110100	G0110098
M3	0.50	48	15.0	5	3.15	2.5	3	F0110117	F0110118	F0110119	G0110117
M3.5	0.60	50	17.0	5	3.55	2.8	3	F0110137	F0110138	F0110139	G0110137
M4	0.70	53	17.0	6	4.0	3.15	3	F0110158	F0110159	F0110160	G0110158
M4.5	0.75	53	17.0	6	4.5	3.55	3	F0110177	F0110178	F0110179	G0110177
M5	0.80	58	16.0	7	5.0	4.0	3	F0110197	F0110198	F0110199	G0110197
M6	1.00	66	19.0	8	6.3	5.0	3	F0110236	F0110237	F0110238	G0110236
M7	1.00	66	19.0	8	7.1	5.6	4	F0110276	F0110277	F0110278	G0110276
M8	1.25	72	22.0	9	8.0	6.3	4	F0110315	F0110316	F0110317	G0110315
M9	1.25	72	22.0	10	9.0	7.1	4	F0110354	F0110355	F0110356	G0110354
M10	1.50	80	24.0	11	10.0	8.0	4	F0110394	F0110395	F0110396	G0110394
M11	1.50	85	25.0	9	8.0	6.3	4	F0110433	F0110434	F0110435	G0110433
M12	1.75	89	29.0	10	9.0	7.1	4	F0110472	F0110473	F0110474	G0110472
M14	2.00	95	30.0	12	11.2	9.0	4	F0110551	F0110552	F0110553	G0110551
M16	2.00	102	32.0	13	12.5	10.0	4	F0110630	F0110631	F0110632	G0110630
M18	2.50	112	37.0	14	14.0	11.2	4	F0110709	F0110710	F0110711	G0110709
M20	2.50	112	37.0	14	14.0	11.2	4	F0110787	F0110788	F0110789	G0110787

► LARGER SIZES AVAILABLE ON REQUEST MANY STOCKED

METRIC FINE HAND TAPS



HSS Bright ISO529 / BS949 6H

Series No. F021, G021



Size	Pitch	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	Z	EUROPA CODE			SET No. (3 TAPS)
								Taper Lead	Second Lead	Bottoming Lead	
M3	0.35	48	15.0	5	3.15	2.5	3	F0210117	F0210118	F0210119	G0210117
M3.5	0.35	50	17.0	5	3.55	2.8	3	F0210137	F0210138	F0210139	G0210137
M4	0.50	53	17.0	6	4.0	3.15	3	F0210158	F0210159	F0210160	G0210158
M4.5	0.50	53	17.0	6	4.5	3.55	3	F0210177	F0210178	F0210179	G0210177
M5	0.50	58	16.0	7	5.0	4.0	3	F0210197	F0210198	F0210199	G0210197
M6	0.50	66	19.0	8	6.3	5.0	3	F0310236	F0310237	F0310238	G0310236
M6	0.75	66	19.0	8	6.3	5.0	3	F0210236	F0210237	F0210238	G0210236
M7	0.75	66	19.0	8	7.1	5.6	4	F0210276	F0210277	F0210278	G0210276
M8	0.50	72	22.0	9	8.0	6.3	4	F0410315	F0410316	F0410317	G0410315
M8	0.75	72	22.0	9	8.0	6.3	4	F0310315	F0310316	F0310317	G0310315
M8	1.00	72	22.0	9	8.0	6.3	4	F0210315	F0210316	F0210317	G0210315
M9	1.00	72	22.0	10	9.0	7.1	4	F0210354	F0210355	F0210356	G0210354
M10	0.75	80	24.0	11	10.0	8.0	4	F0410394	F0410395	F0410396	G0410394
M10	1.00	80	24.0	11	10.0	8.0	4	F0310394	F0310395	F0310396	G0310394
M10	1.25	80	24.0	11	10.0	8.0	4	F0210394	F0210395	F0210396	G0210394
M11	0.75	85	25.0	9	8.0	6.3	4	F0410433	F0410434	F0410435	G0410433
M11	1.00	85	25.0	9	8.0	6.3	4	F0210433	F0210434	F0210435	G0210433
M12	1.00	89	29.0	10	9.0	7.1	4	F0410472	F0410473	F0410474	G0410472
M12	1.25	89	29.0	10	9.0	7.1	4	F0210472	F0210473	F0210474	G0210472
M12	1.50	89	29.0	10	9.0	7.1	4	F0310472	F0310473	F0310474	G0310472
M14	1.00	95	30.0	12	11.2	9.0	4	F0410551	F0410552	F0410553	G0410551
M14	1.25	95	30.0	12	11.2	9.0	4	F0310551	F0310552	F0310553	G0310551
M14	1.50	95	30.0	12	11.2	9.0	4	F0210551	F0210552	F0210553	G0210551
M16	1.00	102	32.0	13	12.5	10.0	4	F0410630	F0410631	F0410632	G0410630
M16	1.50	102	32.0	13	12.5	10.0	4	F0210630	F0210631	F0210632	G0210630
M18	1.00	112	37.0	14	14.0	11.2	4	F0410709	F0410710	F0410711	G0410709
M18	1.50	112	37.0	14	14.0	11.2	4	F0210709	F0210710	F0210711	G0210709
M18	2.00	112	37.0	14	14.0	11.2	4	F0310709	F0310710	F0310711	G0310709
M20	1.00	112	37.0	14	14.0	11.2	4	F0410787	F0410788	F0410789	G0410787
M20	1.50	112	37.0	14	14.0	11.2	4	F0210787	F0210788	F0210789	G0210787
M20	2.00	112	37.0	14	14.0	11.2	4	F0310787	F0310788	F0310789	G0310787

► LARGER SIZES AVAILABLE ON REQUEST MANY STOCKED

UNC HAND TAPS



HSS Bright ISO529 / BS949 2B

Series No. F091, G091



Size	TPI	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE			SET No. (3 TAPS)
								Taper Lead	Second Lead	Bottoming Lead	
No.1	64	41	8.0	4	2.5	2.0	3	F0910073	F0910074	F0910075	G0910073
No.2	56	44.5	9.5	5	2.8	2.24	3	F0910086	F0910087	F0910088	G0910086
No.3	48	44.5	9.5	5	2.8	2.24	3	F0910099	F0910100	F0910101	G0910099
No.4	40	48	15.0	5	3.15	2.5	3	F0910112	F0910113	F0910114	G0910112
No.5	40	48	15.0	5	3.15	2.5	3	F0910124	F0910125	F0910126	G0910124
No.6	32	50	17.0	5	3.55	2.8	3	F0910138	F0910139	F0910140	G0910138
No.8	32	53	17.0	6	4.5	3.55	3	F0910164	F0910165	F0910166	G0910164
No.10	24	58	16.0	7	5.0	4.0	3	F0910190	F0910191	F0910192	G0910190
No.12	24	62	17.0	7	5.6	4.5	3	F0910216	F0910217	F0910218	G0910216
1/4	20	66	19.0	8	6.3	5.0	4	F0910250	F0910251	F0910252	G0910250
5/16	18	72	22.0	9	8.0	6.3	4	F0910312	F0910313	F0910314	G0910312
3/8	16	80	24.0	11	10.0	8.0	4	F0910375	F0910376	F0910377	G0910375
7/16	14	85	25.0	9	8.0	6.3	4	F0910438	F0910439	F0910440	G0910438
1/2	13	89	29.0	10	9.0	7.1	4	F0910500	F0910501	F0910502	G0910500
9/16	12	95	30.0	12	11.2	9.0	4	F0910562	F0910563	F0910564	G0910562
5/8	11	102	32.0	13	12.5	10.0	4	F0910625	F0910626	F0910627	G0910625
3/4	10	112	37.0	14	14.0	11.2	4	F0910750	F0910751	F0910752	G0910750
7/8	9	118	38.0	16	16.0	12.5	4	F0910875	F0910876	F0910877	G0910875
1"	8	130	45.0	18	18.0	14.0	4	F0911000	F0911001	F0911002	G0911000

► LARGER SIZES AVAILABLE ON REQUEST MANY STOCKED

UNF HAND TAPS



HSS Bright ISO529 / BS949 2B

Series No. F101, G101



Size	TPI	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE			SET No. (3 TAPS)
								Taper Lead	Second Lead	Bottoming Lead	
No.0	80	41	8.0	4	2.5	2.0	3	F1010060	F1010061	F1010062	G1010060
No.1	72	41	8.0	4	2.5	2.0	3	F1010073	F1010074	F1010075	G1010073
No.2	64	44.5	9.5	5	2.8	2.24	3	F1010086	F1010087	F1010088	G1010086
No.3	56	44.5	9.5	5	2.8	2.24	3	F1010099	F1010100	F1010101	G1010099
No.4	48	48	15.0	5	3.15	2.5	3	F1010112	F1010113	F1010114	G1010112
No.5	44	48	15.0	5	3.15	2.5	3	F1010124	F1010125	F1010126	G1010124
No.6	40	50	17.0	5	3.55	2.8	3	F1010138	F1010139	F1010140	G1010138
No.8	36	53	17.0	6	4.5	3.55	3	F1010164	F1010165	F1010166	G1010164
No.10	32	58	16.0	7	5.0	4.0	3	F1010190	F1010191	F1010192	G1010190
No.12	28	62	17.0	7	5.6	4.5	3	F1010216	F1010217	F1010218	G1010216
1/4	28	66	19.0	8	6.3	5.0	4	F1010250	F1010251	F1010252	G1010250
5/16	24	72	22.0	9	8.0	6.3	4	F1010312	F1010313	F1010314	G1010312
3/8	24	80	24.0	11	10.0	8.0	4	F1010375	F1010376	F1010377	G1010375
7/16	20	85	25.0	9	8.0	6.3	4	F1010438	F1010439	F1010440	G1010438
1/2	20	89	29.0	10	9.0	7.1	4	F1010500	F1010501	F1010502	G1010500
9/16	18	95	30.0	12	11.2	9.0	4	F1010562	F1010563	F1010564	G1010562
5/8	18	102	32.0	13	12.5	10.0	4	F1010625	F1010626	F1010627	G1010625
3/4	16	112	37.0	14	14.0	11.2	4	F1010750	F1010751	F1010752	G1010750
7/8	14	118	38.0	16	16.0	12.5	4	F1010875	F1010876	F1010877	G1010875
1"	12	130	45.0	18	18.0	14.0	4	F1011000	F1011001	F1011002	G1011000

► LARGER SIZES AVAILABLE ON REQUEST MANY STOCKED

BSPF HAND TAPS



HSS Bright ISO2284 / BS949 G-Series

Series No. F301, G301



Size	TPI	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE			SET No. (3 TAPS)
								Taper Lead	Second Lead	Bottoming Lead	
1/8	28	59	15.0	9	8.0	6.3	4	F3010125	F3010126	F3010127	G3010125
1/4	19	67	19.0	11	10.0	8.0	4	F3010250	F3010251	F3010252	G3010250
3/8	19	75	21.0	13	12.5	10.0	4	F3010375	F3010376	F3010377	G3010375
1/2	14	87	26.0	16	16.0	12.5	4	F3010500	F3010501	F3010502	G3010500
5/8	14	91	26.0	18	18.0	14.0	4	F3010625	F3010626	F3010627	G3010625
3/4	14	96	28.0	20	20.0	16.0	4	F3010750	F3010751	F3010752	G3010750
7/8	14	102	29.0	22	22.4	18.0	4	F3010875	F3010876	F3010877	G3010875
1"	11	109	33.0	24	25.0	20.0	6	F3011000	F3011001	F3011002	G3011000

► LARGER SIZES AVAILABLE ON REQUEST MANY STOCKED

BSPT HAND TAPS



HSS Bright ISO2284 / BS949 Rc-Series

Series No. F311, G311



Size	TPI	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE			SET No. (3 TAPS)
								Taper Lead	Second Lead	Bottoming Lead	
1/8	28	59	15.0	9	8.0	6.3	3	F3110125	F3110126	F3110127	G3110125
1/4	19	67	19.0	11	10.0	8.0	5	F3110250	F3110251	F3110252	G3110250
3/8	19	75	21.0	13	12.5	10.0	5	F3110375	F3110376	F3110377	G3110375
1/2	14	87	26.0	16	16.0	12.5	5	F3110500	F3110501	F3110502	G3110500
3/4	14	96	28.0	20	20.0	16.0	5	F3110750	F3110751	F3110752	G3110750
7/8	14	102	29.0	22	22.4	18.0	5	F3110875	F3110876	F3110877	G3110875
1"	11	109	33.0	24	25.0	20.0	5	F3111000	F3111001	F3111002	G3111000

► LARGER SIZES AVAILABLE ON REQUEST MANY STOCKED

BLUE WIZARD SPIRAL POINT METRIC COARSE



HSS VAP ISO529 / BS949 6H

Series No. F013



Size	Pitch	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE
M1.6	0.35	41	8.0	4	2.5	2.0	2	F0130066
M2	0.40	41	9.5	4	2.5	2.0	2	F0130082
M2.5	0.45	44	9.5	5	2.8	2.24	2	F0130101
M3	0.50	48	15.0	5	3.15	2.5	2	F0130120
M3.5	0.60	50	17.0	5	3.55	2.8	2	F0130140
M4	0.70	53	17.0	6	4.0	3.15	2	F0130161
M4.5	0.75	53	17.0	6	4.5	3.55	2	F0130180
M5	0.80	58	16.0	7	5.0	4.0	3	F0130200
M6	1.00	66	19.0	8	6.3	5.0	3	F0130239
M7	1.00	66	19.0	8	7.1	5.6	3	F0130279
M8	1.25	72	22.0	9	8.0	6.3	3	F0130318
M10	1.50	80	24.0	11	10.0	8.0	3	F0130397
M12	1.75	89	29.0	10	9.0	7.1	3	F0130475
M14	2.00	95	30.0	12	11.2	9.0	3	F0130554
M16	2.00	102	32.0	13	12.5	10.0	3	F0130633
M18	2.50	112	37.0	14	14.0	11.2	3	F0130712
M20	2.50	112	37.0	14	14.0	11.2	3	F0130790

► LARGER SIZES AVAILABLE ON REQUEST MANY STOCKED

Cutting Speed

V _c (m/min)	P			K		N	
	11	12	13	31	33	71	72
	10 - 15			8 - 10		10 - 20	

BLUE WIZARD SPIRAL POINT METRIC FINE



HSS VAP ISO529 / BS949 6H

Series No. F023, F033



Size	Pitch	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE
M4	0.50	53	17.0	6	4.0	3.15	2	F0230161
M5	0.50	58	16.0	7	5.0	4.0	3	F0230200
M6	0.75	66	19.0	8	6.3	5.0	3	F0230239
M8	1.00	72	22.0	9	8.0	6.3	3	F0230318
M10	1.00	80	24.0	11	10.0	8.0	3	F0330397
M10	1.25	80	24.0	11	10.0	8.0	3	F0230397
M12	1.25	89	29.0	10	9.0	7.1	3	F0230475
M12	1.50	89	29.0	10	9.0	7.1	3	F0330475
M14	1.25	95	30.0	12	11.2	9.0	3	F0330554
M14	1.50	95	30.0	12	11.2	9.0	3	F0230554
M16	1.50	102	32.0	13	12.5	10.0	3	F0230633
M18	1.50	112	37.0	14	14.0	11.2	3	F0230712
M20	1.50	112	37.0	14	14.0	11.2	3	F0230790

Cutting Speed

V _c (m/min)	P			K		N	
	11	12	13	31	33	71	72
	10 - 15			8 - 10		10 - 20	

BLUE WIZARD SPIRAL POINT UNC



HSS VAP ISO529 / BS949 2B

Series No. F093



Size	TPI	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE
No.1	64	41	8.0	4	2.5	2.0	2	F0930076
No.2	56	44	9.5	5	2.8	2.24	2	F0930089
No.3	48	44	9.5	5	2.8	2.24	2	F0930102
No.4	40	48	15.0	5	3.15	2.5	2	F0930115
No.5	40	48	15.0	5	3.15	2.5	2	F0930127
No.6	32	50	17.0	5	3.55	2.8	2	F0930141
No.8	32	53	17.0	6	4.5	3.55	2	F0930167
No.10	24	58	16.0	7	5.0	4.0	3	F0930193
No.12	24	62	17.0	7	5.6	4.5	3	F0930219
1/4	20	66	19.0	8	6.3	5.0	3	F0930253
5/16	18	72	22.0	9	8.0	6.3	3	F0930315
3/8	16	80	24.0	11	10.0	8.0	3	F0930378
7/16	14	85	25.0	9	8.0	6.3	3	F0930441
1/2	13	89	29.0	10	9.0	7.1	3	F0930503
9/16	12	95	30.0	12	11.2	9.0	3	F0930565
5/8	11	102	32.0	13	12.5	10.0	3	F0930628
3/4	10	112	37.0	14	14.0	11.2	3	F0930753
7/8	9	118	38.0	16	16.0	12.5	3	F0930878
1"	8	130	45.0	18	18.0	14.0	3	F0931003

Cutting Speed

V _c (m/min)	P			K		N	
	11	12	13	31	33	71	72
	10 - 15			8 - 10		10 - 20	

BLUE WIZARD SPIRAL POINT UNF



HSS VAP ISO529 / BS949 2B

Series No. F103



Size	TPI	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE
No.0	80	41	8.0	4	2.5	2.0	2	F1030063
No.1	72	41	8.0	4	2.5	2.0	2	F1030076
No.2	64	44	9.5	5	2.8	2.24	2	F1030089
No.3	56	44	9.5	5	2.8	2.24	2	F1030102
No.4	48	48	15.0	5	3.15	2.5	2	F1030115
No.5	44	48	15.0	5	3.15	2.5	2	F1030127
No.6	40	50	17.0	5	3.55	2.8	2	F1030141
No.8	36	53	17.0	6	4.5	3.55	2	F1030167
No.10	32	58	16.0	7	5.0	4.0	3	F1030193
No.12	28	62	17.0	7	5.6	4.5	3	F1030219
1/4	28	66	19.0	8	6.3	5.0	3	F1030253
5/16	24	72	22.0	9	8.0	6.3	3	F1030315
3/8	24	80	24.0	11	10.0	8.0	3	F1030378
7/16	20	85	25.0	9	8.0	6.3	3	F1030441
1/2	20	89	29.0	10	9.0	7.1	3	F1030503
9/16	18	95	30.0	12	11.2	9.0	3	F1030565
5/8	18	102	32.0	13	12.5	10.0	3	F1030628
3/4	16	112	37.0	14	14.0	11.2	3	F1030753
7/8	14	118	38.0	16	16.0	12.5	3	F1030878
1"	12	130	45.0	18	18.0	14.0	3	F1031003

Cutting Speed

V _c (m/min)	P			K		N	
	11	12	13	31	33	71	72
	10 - 15			8 - 10		10 - 20	

BLUE MERLIN SPIRAL FLUTE METRIC COARSE



HSS VAP ISO529 / BS949 6H

Series No. F015



Size	Pitch	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE
M3	0.50	48	15.0	5	3.15	2.5	2	F0150121
M3.5	0.60	50	17.0	5	3.55	2.8	2	F0150141
M4	0.70	53	17.0	6	4.0	3.15	2	F0150161
M5	0.80	58	16.0	7	5.0	4.0	3	F0150200
M6	1.00	66	19.0	8	6.3	5.0	3	F0150240
M7	1.00	66	19.0	8	7.1	5.6	3	F0150280
M8	1.25	72	22.0	9	8.0	6.3	3	F0150319
M10	1.50	80	24.0	11	10.0	8.0	3	F0150398
M12	1.75	89	29.0	10	9.0	7.1	3	F0150476
M14	2.00	95	30.0	12	11.2	9.0	3	F0150555
M16	2.00	102	32.0	13	12.5	10.0	3	F0150634
M18	2.50	112	37.0	14	14.0	11.2	3	F0150713
M20	2.50	112	37.0	14	14.0	11.2	3	F0150791

► LARGER SIZES AVAILABLE ON REQUEST MANY STOCKED

Cutting Speed

V _c (m/min)	P			K		N	
	11	12	13	31	33	71	72
	10 - 15			8 - 10		10 - 20	

BLUE MERLIN SPIRAL FLUTE METRIC FINE



HSS VAP ISO529 / BS949 6H

Series No. F025, F035



Size	Pitch	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE
M4	0.50	53	17.0	6	4.0	3.15	2	F0250161
M5	0.50	58	16.0	7	5.0	4.0	3	F0250200
M6	0.75	66	19.0	8	6.3	5.0	3	F0250240
M8	1.00	72	22.0	9	8.0	6.3	3	F0250319
M10	1.00	80	24.0	11	10.0	8.0	3	F0350398
M10	1.25	80	24.0	11	10.0	8.0	3	F0250399
M12	1.25	89	29.0	10	9.0	7.1	3	F0250476
M12	1.50	89	29.0	10	9.0	7.1	3	F0350476
M14	1.25	95	30.0	12	11.2	9.0	3	F0350555
M14	1.50	95	30.0	12	11.2	9.0	3	F0250555
M16	1.50	102	32.0	13	12.5	10.0	3	F0250634
M18	1.50	112	37.0	14	14.0	11.2	3	F0250713
M20	1.50	112	37.0	14	14.0	11.2	3	F0250791

Cutting Speed

V _c (m/min)	P			K		N	
	11	12	13	31	33	71	72
	10 - 15			8 - 10		10 - 20	

BLUE MERLIN SPIRAL FLUTE UNC



HSS VAP ISO529 / BS949 2B

Series No. F095



Size	TPI	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE
No.4	40	48	15.0	5	3.15	2.5	2	F0950116
No.5	40	48	15.0	5	3.15	2.5	2	F0950128
No.6	32	50	17.0	5	3.55	2.8	3	F0950142
No.8	32	53	17.0	6	4.5	3.55	3	F0950168
No.10	24	58	16.0	7	5.0	4.0	3	F0950194
1/4	20	66	19.0	8	6.3	5.0	3	F0950254
5/16	18	72	22.0	9	8.0	6.3	3	F0950316
3/8	16	80	24.0	11	10.0	8.0	3	F0950379
7/16	14	85	25.0	9	8.0	6.3	3	F0950442
1/2	13	89	29.0	10	9.0	7.1	3	F0950504
9/16	12	95	30.0	12	11.2	9.0	3	F0950566
5/8	11	102	32.0	13	12.5	10.0	3	F0950629
3/4	10	112	37.0	14	14.0	11.2	3	F0950754
7/8	9	118	38.0	16	16.0	12.5	3	F0950879
1"	8	130	45.0	18	18.0	14.0	3	F0951004

Cutting Speed

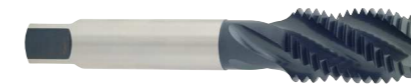
V _c (m/min)	P			K		N	
	11	12	13	31	33	71	72
	10 - 15			8 - 10		10 - 20	

BLUE MERLIN SPIRAL FLUTE UNF



HSS VAP ISO529 / BS949 2B

Series No. F105



Size	TPI	Overall Length	Flute Length	Square Length	Shank Dia	Square A/F	z	EUROPA CODE
No.4	48	48	15.0	5	3.15	2.5	2	F1050116
No.5	44	48	15.0	5	3.15	2.5	2	F1050128
No.6	40	50	17.0	5	3.55	2.8	2	F1050142
No.8	36	53	17.0	6	4.5	3.55	2	F1050168
No.10	32	58	16.0	7	5.0	4.0	3	F1050194
1/4	28	66	19.0	8	6.3	5.0	3	F1050254
5/16	24	72	22.0	9	8.0	6.3	3	F1050316
3/8	24	80	24.0	11	10.0	8.0	3	F1050379
7/16	20	85	25.0	9	8.0	6.3	3	F1050442
1/2	20	89	29.0	10	9.0	7.1	3	F1050504
9/16	18	95	30.0	12	11.2	9.0	3	F1050566
5/8	18	102	32.0	13	12.5	10.0	3	F1050629
3/4	16	112	37.0	14	14.0	11.2	3	F1050754
7/8	14	118	38.0	16	16.0	12.5	3	F1050879
1"	12	130	45.0	18	18.0	14.0	3	F1051004

Cutting Speed

V _c (m/min)	P			K		N	
	11	12	13	31	33	71	72
	10 - 15			8 - 10		10 - 20	

SUPERIOR PERFORMANCE



HSGT DIES SPLIT & SOLID

DIES & DIENUTS



13/16" - 3" diameter
depending on size.

Premium HSS for
extended tool life.

Fully ground
thread forms.

Split dies for fine thread adjustment.
Solid dies for BSPT thread forms.




IDEAL FOR MATERIAL GROUPS




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CIRCULAR DIES METRIC



HSS Bright BS1127 SPLIT

Series No. J011 - J015



Size	Pitch	Outside Diameter	Width	EUROPA CODE
M1.6	0.35	13/16	1/4	J0110063
M2	0.4	13/16	1/4	J0110079
M2.5	0.45	13/16	1/4	J0110098
M3	0.5	13/16	1/4	J0110118
M3.5	0.6	13/16	1/4	J0110138
M4	0.7	13/16	1/4	J0110159
M4	0.7	1	3/8	J0120161
M4.5	0.75	13/16	1/4	J0110178
M5	0.8	13/16	1/4	J0110198
M5	0.8	1	3/8	J0120200
M6	1.0	13/16	1/4	J0110237
M6	1.0	1	3/8	J0120238
M6	1.0	1.5/16	7/16	J0130239
M8	1.25	1	3/8	J0120316
M8	1.25	1.5/16	7/16	J0130317
M10	1.5	1	3/8	J0120396
M10	1.5	1.5/16	7/16	J0130397
M10	1.5	1.1/2	1/2	J0140398
M12	1.75	1.5/16	7/16	J0130473
M12	1.75	1.1/2	1/2	J0140474
M12	1.75	2	5/8	J0150475
M14	2.0	1.5/16	7/16	J0130553
M14	2.0	1.1/2	1/2	J0140554
M14	2.0	2	5/8	J0150555
M16	2.0	1.1/2	1/2	J0140631
M16	2.0	2	5/8	J0150632
M18	2.5	1.1/2	1/2	J0140710
M18	2.5	2	5/8	J0150710
M20	2.5	1.1/2	1/2	J0140788
M20	2.5	2	5/8	J0150788

► MORE SIZES AVAILABLE ON REQUEST

CIRCULAR DIES METRIC FINE



HSS Bright BS1127 SPLIT

Series No. J011 - J015



Size	Pitch	Outside Diameter	Width	EUROPA CODE
M3	0.35	13/16	1/4	J0110117
M4	0.5	13/16	1/4	J0110158
M5	0.5	13/16	1/4	J0110197
M6	0.75	13/16	1/4	J0110236
M8	1.0	1	3/8	J0120315
M10	1.0	1	3/8	J0120394
M10	1.25	1	3/8	J0120395
M12	1.25	1.5/16	7/16	J0130472
M14	1.5	1.5/16	7/16	J0130552
M16	1.5	1.1/2	1/2	J0140630
M18	1.5	1.1/2	1/2	J0140709
M20	1.5	2	5/8	J0150787

► MORE SIZES AVAILABLE ON REQUEST

CIRCULAR DIES UNC



HSS Bright BS1127 SPLIT

Series No. J091 - J097



Size	TPI	Outside Diameter	Width	EUROPA CODE
No.1	64	13/16	1/4	J0910073
No.2	56	13/16	1/4	J0910086
No.3	48	13/16	1/4	J0910099
No.4	40	13/16	1/4	J0910112
No.5	40	13/16	1/4	J0910124
No.6	32	13/16	1/4	J0910138
No.8	32	13/16	1/4	J0910164
No.10	24	13/16	1/4	J0910190
No.12	24	13/16	1/4	J0910216
1/4	20	13/16	1/4	J0910250
1/4	20	1	3/8	J0920251
1/4	20	1.5/16	7/16	J0930252
5/16	18	1	3/8	J0920312
5/16	18	1.5/16	7/16	J0930313
3/8	16	1	3/8	J0920375
3/8	16	1.5/16	7/16	J0930376
3/8	16	1.1/2	1/2	J0940377
7/16	14	1.5/16	7/16	J0930438
7/16	14	1.1/2	1/2	J0940439
1/2	13	1.5/16	7/16	J0930500
1/2	13	1.1/2	1/2	J0940501
1/2	13	2	5/8	J0950502
9/16	12	1.5/16	7/16	J0930562
9/16	12	1.1/2	1/2	J0940563
9/16	12	2	5/8	J0950564
5/8	11	1.1/2	1/2	J0940625
5/8	11	2	5/8	J0950626
3/4	10	1.1/2	1/2	J0940749
3/4	10	2	5/8	J0950750
7/8	9	2	5/8	J0950875
1	8	2	5/8	J0951000
1	8	3	7/8	J0971002

► MORE SIZES AVAILABLE ON REQUEST

CIRCULAR DIES UNF



HSS Bright BS1127 SPLIT

Series No. J101 - J107



Size	TPI	Outside Diameter	Width	EUROPA CODE
No.0	80	13/16	1/4	J1010060
No.1	72	13/16	1/4	J1010073
No.2	64	13/16	1/4	J1010086
No.3	56	13/16	1/4	J1010099
No.4	48	13/16	1/4	J1010112
No.5	44	13/16	1/4	J1010124
No.6	40	13/16	1/4	J1010138
No.8	36	13/16	1/4	J1010164
No.10	32	13/16	1/4	J1010190
No.12	28	13/16	1/4	J1010216
1/4	28	13/16	1/4	J1010250
1/4	28	1	3/8	J1020251
1/4	28	1.5/16	7/16	J1030252
5/16	24	1	3/8	J1020312
5/16	24	1.5/16	7/16	J1030313
3/8	24	1	3/8	J1020375
3/8	24	1.5/16	7/16	J1030376
3/8	24	1.1/2	1/2	J1040377
7/16	20	1.5/16	7/16	J1030438
7/16	20	1.1/2	1/2	J1040439
1/2	20	1.5/16	7/16	J1030500
1/2	20	1.1/2	1/2	J1040501
1/2	20	2	5/8	J1050502
9/16	18	1.5/16	7/16	J1030562
9/16	18	1.1/2	1/2	J1040563
9/16	18	2	5/8	J1050564
5/8	18	1.1/2	1/2	J1040625
5/8	18	2	5/8	J1050626
3/4	16	1.1/2	1/2	J1040749
3/4	16	2	5/8	J1050750
7/8	14	2	5/8	J1050875
1	12	2	5/8	J1051000
1	12	3	7/8	J1071002

► MORE SIZES AVAILABLE ON REQUEST

CIRCULAR DIES BSPF



HSS Bright BS1127 SPLIT G-Series

Series No. J302 - J306



Size	TPI	Outside Diameter	Width	EUROPA CODE
1/8	28	1	3/8	J3020125
1/8	28	1.5/16	7/16	J3030126
1/8	28	1.1/2	1/2	J3040127
1/4	19	1.5/16	7/16	J3030250
1/4	19	1.1/2	1/2	J3040251
1/4	19	2	5/8	J3050252
3/8	19	1.1/2	1/2	J3040375
3/8	19	2	5/8	J3050376
1/2	14	2	5/8	J3050500
5/8	14	2	5/8	J3050625
3/4	14	2	5/8	J3050750
1	11	2.1/4	11/16	J3061000

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CIRCULAR DIES BSPT



HSS Bright BS1127 SOLID Rc-Series

Series No. J5B2 - J5B6



Size	TPI	Outside Diameter	Width	EUROPA CODE
1/8	28	1	3/8	J5B20125
1/8	28	1.5/16	7/16	J5B30126
1/8	28	1.1/2	1/2	J5B40127
1/4	19	1.5/16	7/16	J5B30251
1/4	19	1.1/2	1/2	J5B40251
1/4	19	2	5/8	J5B50252
3/8	19	1.1/2	1/2	J5B40375
3/8	19	2	5/8	J5B50376
1/2	14	2	5/8	J5B50500
1/2	14	2.1/4	11/16	J5B60501
3/4	14	2	5/8	J5B50750
3/4	14	2.1/4	11/16	J5B60751
1	11	2.1/4	11/16	J5B61000

► MORE SIZES AVAILABLE ON REQUEST

DIENUTS METRIC



HSS Bright BS1127

Series No. J611



Size	Pitch	A/F (INCH)	Width	EUROPA CODE
M3	0.5	0.71	1/4	J6110117
M4	0.7	0.71	1/4	J6110158
M5	0.8	0.71	1/4	J6110197
M6	1.0	0.71	1/4	J6110236
M8	1.25	0.82	5/16	J6110315
M10	1.5	0.92	3/8	J6110394
M12	1.75	1.1	1/2	J6110472
M14	2.0	1.3	5/8	J6110551
M16	2.0	1.3	5/8	J6110630
M18	2.5	1.48	11/16	J6110709
M20	2.5	1.48	11/16	J6110787

► MORE SIZES AVAILABLE ON REQUEST

DIENUTS METRIC FINE



HSS Bright BS1127

Series No. J612



Size	Pitch	A/F (INCH)	Width	EUROPA CODE
M3	0.35	0.71	1/4	J6120117
M4	0.5	0.71	1/4	J6120158
M5	0.5	0.71	1/4	J6120197
M6	0.75	0.71	1/4	J6120236
M8	1.0	0.82	5/16	J6120315
M10	1.0	0.92	3/8	J6120394
M12	1.25	1.1	1/2	J6120472
M14	1.5	1.3	1/2	J6120551
M16	1.5	1.3	1/2	J6120630
M18	1.5	1.48	1/2	J6120709
M20	1.5	1.48	5/8	J6120787

► MORE SIZES AVAILABLE ON REQUEST

DIENUTS UNC



HSS Bright BS1127

Series No. J641



Size	TPI	A/F (INCH)	Width	EUROPA CODE
1/4	20	0.71	1/4	J6410250
5/16	18	0.82	5/16	J6410312
3/8	16	0.92	3/8	J6410375
7/16	14	1.1	7/16	J6410438
1/2	13	1.1	1/2	J6410500
9/16	12	1.3	5/8	J6410562
5/8	11	1.3	5/8	J6410625
3/4	10	1.48	11/16	J6410750
7/8	9	1.67	13/16	J6410875
1	8	2.05	15/16	J6411000

► MORE SIZES AVAILABLE ON REQUEST

DIENUTS UNF



HSS Bright BS1127

Series No. J651



Size	TPI	A/F (INCH)	Width	EUROPA CODE
No.10	32	0.71	1/4	J6510190
1/4	28	0.71	1/4	J6510250
5/16	24	0.82	5/16	J6510312
3/8	24	0.92	3/8	J6510375
7/16	20	1.1	7/16	J6510438
1/2	20	1.1	1/2	J6510500
9/16	18	1.3	5/8	J6510562
5/8	18	1.3	5/8	J6510625
3/4	16	1.48	11/16	J6510750
7/8	14	1.67	13/16	J6510875
1	12	2.05	15/16	J6511000

► MORE SIZES AVAILABLE ON REQUEST

DIENUTS BSPF



HSS Bright BS1127 G-Series

Series No. J701



Size	TPI	A/F (INCH)	Width	EUROPA CODE
1/8	28	0.92	1/4	J7010125
1/4	19	1.1	1/4	J7010250
3/8	19	1.3	3/8	J7010375
1/2	14	1.67	1/2	J7010500
3/4	14	2.05	15/16	J7010750
1	11	2.58	1.1/8	J7011000

► MORE SIZES AVAILABLE ON REQUEST

DIENUTS BSPT



HSS Bright BS1127 Rc-Series

Series No. J711



Size	TPI	A/F (INCH)	Width	EUROPA CODE
1/8	28	0.92	3/8	J7110125
1/4	19	1.1	1/4	J7110250
3/8	19	1.3	3/8	J7110375
1/2	14	1.67	1/2	J7110500
3/4	14	2.05	3/4	J7110750
1	11	2.58	1.1/8	J7111000




► MORE SIZES AVAILABLE ON REQUEST

ACCESSORIES INDEX

DIESTOCKS

Code	Item	Description	Page No.
J895		DS1 - DS8 13/16" - 4"	P.126

TAP WRENCHES

J891		TW1 - TW2 M2 - M12	P.127
J892		TW3 - TW7 M3 - M42	P.127
J893		T1 - TL4 M1 - M12	P.127



DIESTOCKS



Series No. J895



Stock No.	Die Outside Dia.	Length mm	EUROPA CODE
DS1	13/16	165	J8950001
DS2	1	230	J8950002
DS3	1.5/16	280	J8950003
DS4	1.1/2	350	J8950004
DS5	2	550	J8950005
DS6	2.1/4	610	J8950006
DS7	3	790	J8950007
DS8	4	1075	J8950008

TAP WRENCHES



Series No. J891 / 2 / 3

J891Bar Type



Wrench No.	Nominal Tap Size					Length mm	EUROPA CODE
	Inch	UN	BA	mm	Pipe (inch)		
TW1	1/16 - 1/4	0 - 12	12 - 0	M2 - M6	-	105	J8910001
TW2	1/8 - 1/2			M3 - M12	1/8 - 1/4	160	J8910002

J892 Adjustable Type



Wrench No.	Nominal Tap Size					Length mm	EUROPA CODE
	Inch	UN	BA	mm	Pipe (inch)		
TW3	1/8 - 1/2	4.-12		M3 - M12	1/8 - 1/4	270	J8920003
TW4	7/32 - 3/4			M6 - M20	1/8 - 3/8	380	J8920004
TW5	7/16 - 1			M12 - M27	1/4 - 5/8	500	J8920005
TW6	3/4 - 1.1/2			M18 - M42	3/8. - 1	815	J8920006
TW7	1 - 2.1/2			>M24	5/8 - 2.1/2	1300	J8920007

J893 Ratchet Type



Wrench No.	Nominal Tap Size					Length mm	EUROPA CODE
	Inch	UN	BA	mm	Pipe (inch)		
T1 STD	1/16 - 1/4	0 - 12	12 - 0	M1 - M6		85	J8930001
T2 STD	1/4 - 1/2			M6 - M12	1/8 - 1/4	110	J8930002
TL3 LONG	1/16 - 1/4	0 - 12	12 - 0	M1 - M6		250	J8930003
TL4 LONG	1/4 - 1/2			M6 - M12	1/8 - 1/4	300	J8930004



TECHNICAL DATA

- **THREAD MILL PROGRAMMING**
- **ICON GUIDE**
- **GENERAL DATA**
- **TROUBLESHOOTING**
- **MATERIAL CHARTS**

THREAD MILL PROGRAMMING



Programme data.

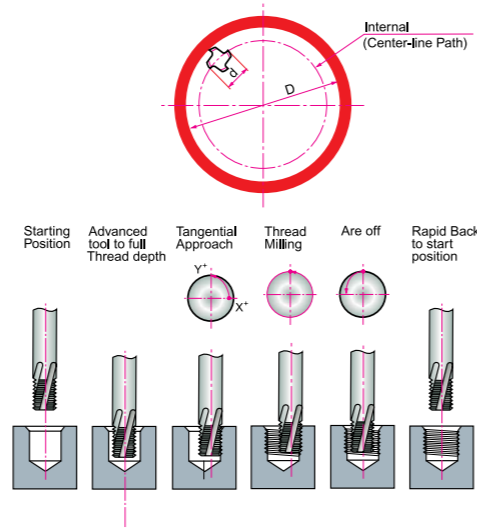
G Codes for Thread Milling

G00 Fast Feed Linear	G41 Cutter Radius Compensation Left	M08 Coolant On
G01 Linear Movement	G42 Cutter Radius Compensation Right	X Horizontal Co-ordinate
G02 Circular/Helical Interpolation C.W.	G43 Tool Length Compensation Plus	Y Horizontal Co-ordinate
G03 Circular/Helical Interpolation A.C.W.	G49 Tool Length Compensation Cancel	Z Vertical Co-ordinate
G17 X, Y Plane (Vertical Machining)	G90 Absolute Command	I X Co-ordinate to Center of Arc Travel
G18 Z, X Plane (Horizontal Machining)	G91 Incremental Command	J Y Co-ordinate to Center of Arc Travel
G19 Y, Z Plane (Using 90 Head)	M03 Clockwise Rotation of Spindle	S Spindle Speed R.P.M.
G40 Cutter Radius Compensation Cancel	M05 Spindle stop	F Feed mm/min

CNC Internal Thread Milling

```

G90 G00 X... Y... Z5 S...
G91 G00 Z...(A3+2)
Y...(A5)
G41 G01 X...(A6) F...
G03 X...(A6) Y...(A6) Z...(A4) I...(A6) J0
G03 X0 Y0 Y...(A2) I0 J...(A1)
G03 X...(A6) Y...(A6) Z...(A4) I0 J...(A6)
G00 G40 X...(A6) Y...(A5)
G90 Z5
    
```



Explanation of Parameters

- A1 : 1/2 Nominal Thread Diameter 1/2D
- A2 : Thread Pitch
- A3 : Thread Depth
- A4 : 1/4P (for climb milling and right-hand thread)
- A5 : Beginning of Contour in Y 0.5xP
- A6 : Arc Off (A1 - A5)

Download our thread mill programme generator.
Visit <http://www.europatool.co.uk/threading/threadmills>

ICON GUIDE



Material icons.

AL	Aluminium & Aluminium Alloys
GS	Steels with good machinability Rm<750N/mm ²
HS	Heat treated and heat-resistant steels Rm>750N/mm ²
VA	Stainless steels
CS	Carbon steels with low contents of alloy Rm<600N/mm ²
GV	Any material with at least 8-10% elongation
GG	Grey Cast Iron
TI	Titanium alloys
NI	Nickel alloys
HA	High alloyed steels Rm>1,200N/mm ²

Surface treatments.

vap	Steam Tempered
TiN	TiN Coated (Titanium Nitride)
NI	Nitrided
TiAlN	TiAlN Coating (Titanium Aluminium Nitride)
Hardslick	Hardslick Coating (Titanium Aluminium Nitride + WC/C)

Chamfer lead acc. to DIN2197

A	Form A (Chamfer Lead 5-6 Threads)
B	Form B (with GUN-Nose and Chamfer Lead 4-5 Threads)
C	Form C (Chamfer Lead 2-3 Threads)
D	Form D (Chamfer Lead 4-5 Threads)
E	Form E (Chamfer Lead 1.5-2 Threads)

GENERAL INFORMATION



Surface treatments.

❖ STEAM TEMPERING (vap)

Steam tempering applies a Fe₃O₄ coating which reduces the friction between tool and workpiece and prevents cold welding.

❖ NITRIDING (NI)

We recommend this surface treatment for machining materials which affect a hard wear / abrasion, such as Grey cast iron, Al-alloys with Si percentage above 10%.

❖ TiN COATING (TiN)

TiN coating has a hardness of approx. 2,300 HV and is temperature-resistant up to approx. 600°C. This is an excellent all-round coating for normal applications.
 Colour : Golden Coefficient of friction against steel : 0.4

❖ TiAlN COATING (TiAlN)

This is a special coating for machining abrasive materials such as Grey cast iron, Al-alloys with silicon, fibre reinforced plastics, etc., or machining under high temperatures, such as insufficient coolant or high speeds $\geq 600\text{m/min}$. TiAlN coating has a hardness of approx. 3,000 HV and is temperature resistant up to approx. 800°C.
 Colour : Violet-Grey Coefficient of friction against steel : 0.4

❖ HARDSLICK COATING

Hardslick combines the advantages of an extremely hard, thermally stable TiAlN coating with the tribological properties of an outer WC/C(Tungsten carbide/carbon) coating. Hardslick coating has a hardness of approx. 3,000 HV and is temperature-resistant up to approx. 800°C.
 Colour : Violet-Grey Coefficient of friction against steel : 0.2

GENERAL INFORMATION



Tapping guide.

TAP SELECTION

The type of tap used depends on the type of material to be machined. Generally, any materials with an elongation of at least 10% can be cold formed, but any other materials need to be cut. Please refer to tap selection guide for most suitable tap.

CORE HOLES

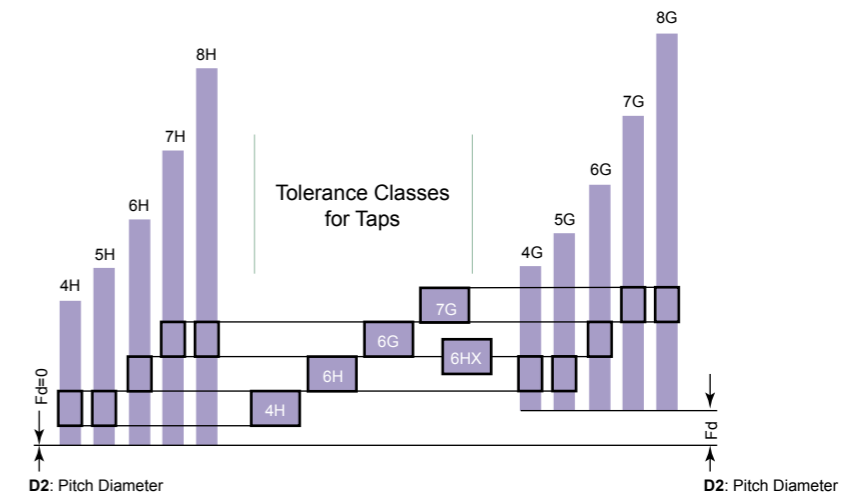
Core holes should be clean and swarf free. In materials that have a tendency to close down after drilling, a slightly larger tapping drill size should be used. Each tap size in this catalogue has a recommended tapping drill size shown in its dimension table.

CUTTING SPEEDS

The correct cutting speed is necessary to control chip flow and establish the best tool life for the tap. Guide values are given in the cutting data charts on pages 86-89. Material hardness and rigidity of workpiece can have a detrimental effect on the tap, so it is worth experimenting with the guide data to establish the best speeds for your particular application.

Tap tolerances.

Tolerance classes of taps and tolerance positions for screw threads as per Metric ISO standard



Tap tolerance ISO	Tap tolerance DIN	Correct class to obtain nut thread with tolerance				
ISO 1	4H	4H	5H			
ISO 2	6H	4G	5G	6H		
ISO 3	6G			6G	7H	8H
	7G				7G	8G

Standard fit for a thread corresponds to tolerance class ISO 2/6H. For more precise fits, without allowance on thread flank, tolerance class ISO 1/4H must be chosen. ISO 3/6G is used in case of loose fits, with large allowance, which is often required for subsequent coatings.

Between classes 6H and 6G taps are produced with tolerance 6HX. These taps are used for tapping abrasive materials, such as cast iron or Al-Si alloys, in order to increase their tool life. Another important application is on cold forming taps, which create the thread by plastic deformation and not by cutting. In this case, due to the elastic return of the material, in order to obtain a thread 6H tolerance, a 6HX tap must be used.

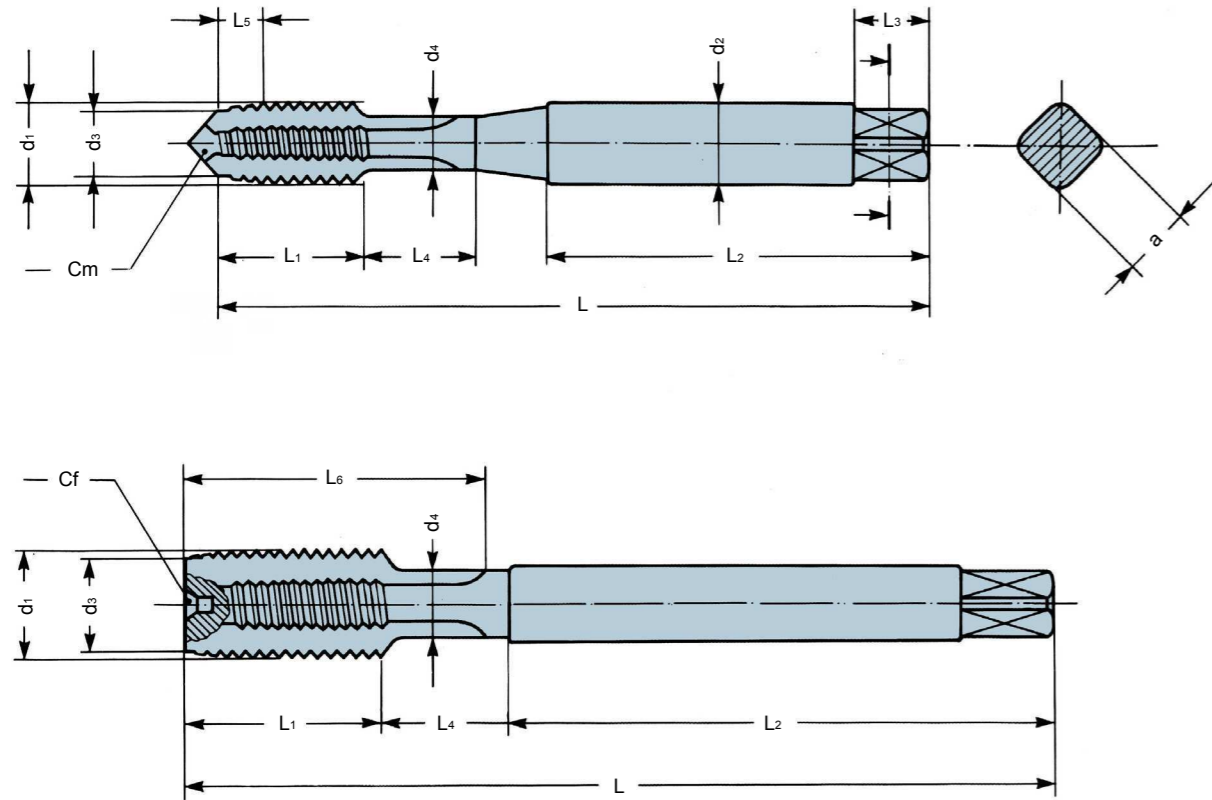
The tolerances described above are collected in the ISO standard ISO 68-1.

GENERAL INFORMATION



TECHNICAL DATA

Tap terminology.



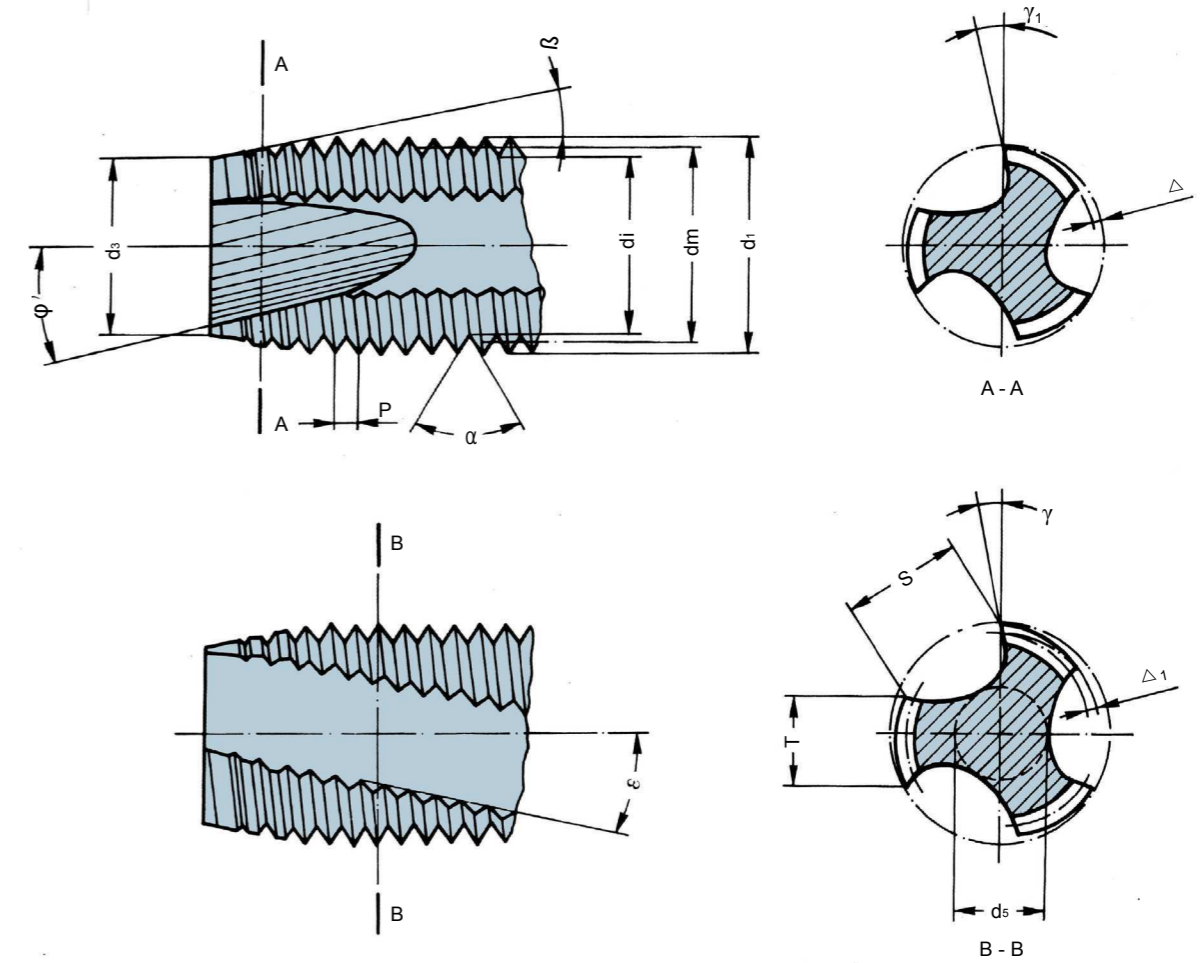
d ₁	Major diameter	L	Overall length
d ₂	Shank diameter	L ₁	Thread length
d ₃	Chamfer diameter	L ₂	Shank length
d ₄	Neck diameter	L ₃	Square length
a	Square	L ₄	Neck length
C _m	Center male	L ₅	Chamfer length
C _f	Center female	L ₆	Flute length

GENERAL INFORMATION



TECHNICAL DATA

Tap terminology.



d ₁	Major diameter	γ	Gun nose rake angle in front
d _m	Flank diameter	Δ	Chamfer relief
d _i	Minor diameter	Δ ₁	Pitch diameter land relief
d ₃	Chamfer diameter	γ	Rake angle
P	Pitch	T	Width of land
α	Flank angle	S	Flute width
β	Chamfer angle	d ₅	Web tickness
φ	Gun nose angle	ε	Angle of spiral flute

GENERAL INFORMATION



Tapping drill sizes for Metric threads.

Metric-ISO threads coarse pitch				Metric-ISO threads fine pitch				Metric-ISO threads fine pitch			
M	Pitch mm.	Maximun core dia. mm.	Drill size mm.	MF	Pitch mm.	Maximun core dia. mm.	Drill size mm.	MF	Pitch mm.	Maximun core dia. mm.	Drill size mm.
1	0.25	0.785	0.75	2.5	0.35	2.221	2.15	25	2.0	23.21	23.0
1.1	0.25	0.885	0.85	3	0.35	2.271	2.65	26	1.5	24.676	24.5
1.2	0.25	0.985	0.95	3.5	0.35	3.221	3.15	27	1.0	26.153	26.0
1.4	0.3	1.16	1.1	4	0.5	3.599	3.5	27	1.5	25.676	25.5
1.6	0.35	1.321	1.25	4.5	0.5	4.099	4.0	27	2.0	25.21	25.0
1.7	0.35	1.346	1.3	5	0.5	4.599	4.5	28	1.0	27.153	27.0
1.8	0.35	1.521	1.45	5.5	0.5	5.099	5.0	28	1.5	26.676	26.5
2	0.4	1.679	1.6	6	0.75	5.378	5.2	28	2.0	26.21	26.0
2.2	0.45	1.838	1.75	7	0.75	6.378	6.2	30	1.0	29.153	29.0
2.3	0.4	1.92	1.9	8	0.75	7.378	7.2	30	1.5	28.676	28.5
2.5	0.45	2.138	2.05	8	1.0	7.153	7.0	30	2.0	28.21	28.0
2.6	0.45	2.176	2.1	9	0.75	8.378	8.2	30	3.0	27.252	27.0
3	0.5	2.599	2.5	9	1.0	8.153	8.0	32	1.5	30.675	30.5
3.5	0.6	3.01	2.9	10	0.75	9.378	9.2	32	2.0	30.21	30.0
4	0.7	3.422	3.3	10	1.0	9.153	9.0	33	1.5	31.676	31.5
4.5	0.75	3.878	3.7	10	1.25	8.912	8.8	33	2.0	31.21	31.0
5	0.8	4.334	4.2	11	0.75	10.378	10.2	33	3.0	30.252	30.0
6	1.0	5.153	5.0	11	1.0	10.153	10.0	35	1.5	33.676	33.5
7	1.0	6.153	6.0	12	1.0	11.153	11.0	36	1.5	34.676	34.5
8	1.25	6.912	6.8	12	1.25	10.912	10.8	36	2.0	34.21	34.0
9	1.25	7.912	7.8	12	1.5	10.676	10.5	36	3.0	33.252	33.0
10	1.5	8.676	8.5	14	1.0	13.153	13.0	38	1.5	36.676	36.5
11	1.5	9.676	9.5	14	1.25	12.912	12.8	39	1.5	37.676	37.5
12	1.75	10.441	10.2	14	1.5	12.676	12.5	39	2.0	37.21	37.0
14	2.0	12.21	12.0	15	1.0	14.153	14.0	39	3.0	36.252	36.0
16	2.0	14.21	14.0	15	1.5	13.676	13.5	40	1.5	38.676	38.5
18	2.5	15.744	15.5	16	1.0	15.153	15.0	40	2.0	38.21	38.0
20	2.5	17.744	17.5	16	1.5	14.676	14.5	40	3.0	37.252	37.0
22	2.5	19.744	19.5	17	1.0	16.153	16.0	42	1.5	40.676	40.5
24	3.0	21.252	21.0	17	1.5	15.676	15.5	42	2.0	40.21	40.0
27	3.0	24.252	24.0	18	1.0	17.153	17.0	42	3.0	39.252	39.0
30	3.5	26.771	26.5	18	1.5	16.676	16.5	45	1.5	43.676	43.5
33	3.5	29.771	29.5	18	2.0	16.21	16.0	45	2.0	43.21	43.0
36	4.0	32.27	32.0	20	1.0	19.153	19.0	45	3.0	42.252	42.0
39	4.0	35.27	35.0	20	1.5	18.676	18.5	48	1.5	46.676	46.5
42	4.5	37.799	37.5	20	2.0	18.21	18.0	48	2.0	46.21	46.0
45	4.5	40.799	40.5	22	1.0	21.153	21.0	48	3.0	45.252	45.0
48	5.0	43.297	43.0	22	1.5	20.676	20.5	50	1.5	48.676	48.5
52	5.0	47.297	47.0	22	2.0	20.21	20.0	50	2.0	48.21	48.0
56	5.5	50.796	50.5	24	1.0	23.153	23.0	50	3.0	47.252	47.0
60	5.5	54.796	54.5	24	1.5	22.676	22.5	52	1.5	50.676	50.5
64	6.0	58.305	58.0	24	2.0	22.21	22.0	52	2.0	50.21	50.0
68	6.0	62.305	62.0	25	1.0	24.153	24.0	52	3.0	49.252	49.0
				25	1.5	23.676	23.5				

GENERAL INFORMATION



Tapping drill sizes for UNC and UNF threads.

Unified Coarse threads			
UNC	TPI	Maximun core dia. mm	Drill size mm.
No.1	64	1.585	1.5
No.2	56	1.872	1.8
No.3	48	2.146	2.1
No.4	40	2.385	2.3
No.5	40	2.697	2.6
No.6	32	2.896	2.85
No.8	32	3.528	3.6
No.10	24	3.95	3.9
No.12	24	4.59	4.5
1/4	20	5.25	5.2
5/16	18	6.68	6.6
3/8	16	8.082	8.0
7/16	14	9.441	9.4
1/2	13	10.881	10.75
9/16	12	12.301	12.25
5/8	11	13.693	13.5
3/4	10	16.624	16.5
7/8	9	19.520	19.5
1	8	22.344	22.25
1.1/8	7	25.082	25.0
1.1/4	7	28.258	28.25
1.3/8	6	30.851	30.75
1.1/2	6	34.026	34.0
1.3/4	5	39.560	39.5
2	4.5	45.367	45.25

Unified Fine threads			
UNF	TPI	Maximun core dia. mm	Drill size mm.
No.0	80	1.306	1.3
No.1	72	1.613	1.6
No.2	64	1.913	1.9
No.3	56	2.197	2.1
No.4	48	2.459	2.4
No.5	44	2.741	2.7
No.6	40	3.012	3.0
No.8	36	3.597	3.5
No.10	32	4.168	4.1
No.12	28	4.717	4.7
1/4	28	5.563	5.5
5/16	24	6.995	6.9
3/8	24	8.565	8.5
7/16	20	9.947	9.9
1/2	20	11.524	11.5
9/16	18	12.969	12.9
5/8	18	14.554	14.5
3/4	16	17.546	17.5
7/8	14	20.493	20.5
1	12	23.363	23.25
1.1/8	12	26.538	26.5
1.1/4	12	29.713	29.5
1.3/8	12	32.888	32.7
1.1/2	12	36.063	36.0

GENERAL INFORMATION



TECHNICAL DATA

Tapping drill sizes for BSP and BSW threads.

Whitworth Pipe threads			
BSP	TPI	Maximun core dia. mm	Drill size mm.
1/8	28	8.848	8.8
1/4	19	11.89	11.8
3/8	19	15.395	15.25
1/2	14	19.172	19.0
5/8	14	21.128	21.0
3/4	14	24.658	24.5
7/8	14	28.418	28.25
1	11	30.931	30.75
1.1/8	11	35.589	35.5
1.1/4	11	39.592	39.5
1.3/8	11	42.005	42.0
1.1/2	11	45.485	45.2
1.5/8	11	49.67	49.6
1.3/4	11	51.428	51.4
2	11	57.396	57.2
2.1/4	11	63.392	63.3
2.3/8	11	67.08	67.0
2.1/2	11	72.866	72.8
2.3/4	11	79.216	79.1
3	11	85.566	85.5
3.1/4	11	91.662	91.5
3.1/2	11	98.012	98.0
3.3/4	11	104.362	104.0
4	11	110.712	110.5

Whitworth threads			
BSW	TPI	Maximun core dia. mm	Drill size mm.
3/32	48	1.91	1.8
1/8	40	2.59	2.5
5/32	32	3.211	3.1
3/16	24	3.743	3.6
7/32	24	4.538	4.4
1/4	20	5.224	5.4
5/16	18	6.661	6.5
3/8	16	8.052	7.9
7/16	14	9.379	9.3
1/2	12	10.61	10.5
9/16	12	12.176	12.0
5/8	11	13.598	13.5
3/4	10	16.538	16.5
7/8	9	19.411	19.25
1	8	22.185	22.0
1.1/8	7	24.879	24.75
1.1/4	7	28.054	27.75
1.3/8	6	30.555	30.5
1.1/2	6	33.73	33.5
1.5/8	5	35.921	35.5
1.3/4	5	39.096	39.0
1.7/8	4.5	41.648	41.5
2	4.5	44.823	44.5
2.1/4	4	50.42	50.0
2.1/2	4	56.77	56.5
2.3/4	3.5	62.108	62.0
3	3.5	68.459	68.5

GENERAL INFORMATION



TECHNICAL DATA

Nominal dimensions UNI 4535-64

Production tolerances on tap flank diameter for ISO 6H Nut threads

Limit dimensions - Nut threads ISO 6H

Metric coarse pitch threads

Dimensions in mm

$$H = 0.86603P$$

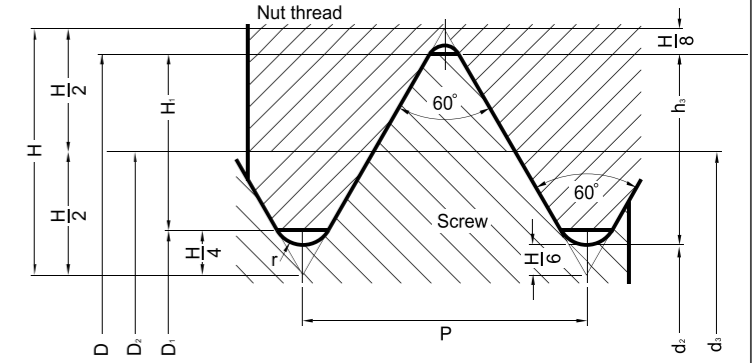
$$H_1 = \frac{5}{8}H = 0.54127P$$

$$h_3 = \frac{17}{24}H = 0.61343P$$

$$d_2 = D_2 = d - \frac{3}{4}H = d - 0.64952P$$

$$d_3 = d - 2h_3 = d - 1.22687P$$

$$r = \frac{H}{6} = 0.14434P$$



Nominal diameter d = D	Pitch P	Flank diameter d ₂ = D ₂	Minor diameter		Thread depth		Radius r	Flank diameter Tap tolerance 6H d ₂		Flank diameter Nut tolerance 6H	
			Screw d ₃	Nut D ₁	Screw h ₃	Nut H ₁		min.	max.	min.	max.
M 1,6	0,35	1,373	1,171	1,221	0,215	0,189	0,051	1,393	1,407	1,373	1,458
M 1,8	0,35	1,573	1,371	1,421	0,215	0,189	0,051	1,593	1,607	1,573	1,658
M 2	0,4	1,740	1,509	1,567	0,245	0,217	0,058	1,761	1,776	1,740	1,830
M 2,2	0,45	1,908	1,648	1,713	0,276	0,244	0,065	1,931	1,946	1,908	2,003
M 2,5	0,45	2,208	1,948	2,013	0,276	0,244	0,065	2,231	2,246	2,208	2,303
M 3	0,5	2,675	2,387	2,459	0,307	0,271	0,072	2,699	2,715	2,675	2,775
M 3,5	0,6	3,110	2,764	2,850	0,368	0,325	0,087	3,137	3,155	3,110	3,222
M 4	0,7	3,545	3,141	3,242	0,429	0,379	0,101	3,574	3,593	3,545	3,663
M 4,5	0,75	4,013	3,580	3,688	0,460	0,406	0,108	4,042	4,061	4,013	4,131
M 5	0,8	4,480	4,019	4,134	0,491	0,433	0,115	4,510	4,530	4,480	4,605
M 6	1	5,350	4,773	4,917	0,613	0,541	0,144	5,385	5,409	5,350	5,500
M 7	1	6,350	5,773	5,917	0,613	0,541	0,144	6,385	6,409	6,350	6,500
M 8	1,25	7,188	6,466	6,647	0,767	0,677	0,180	7,226	7,251	7,188	7,348
M 9	1,25	8,188	7,466	7,647	0,767	0,677	0,180	8,226	8,251	8,188	8,348
M 10	1,5	9,026	8,160	8,376	0,920	0,812	0,217	9,068	9,096	9,026	9,206
M 11	1,5	10,026	9,160	9,376	0,920	0,812	0,217	10,068	10,096	10,026	10,206
M 12	1,75	10,863	9,853	10,106	1,074	0,947	0,253	10,911	10,943	10,863	11,063
M 14	2	12,701	11,546	11,835	1,227	1,083	0,289	12,752	12,786	12,701	12,913
M 16	2	14,701	13,546	13,835	1,227	1,083	0,289	14,752	14,786	14,701	14,913
M 18	2,5	16,376	14,933	15,294	1,534	1,353	0,361	16,430	16,466	16,376	16,600
M 20	2,5	18,376	16,933	17,294	1,534	1,353	0,361	18,430	18,466	18,376	18,600
M 22	2,5	20,376	18,933	19,294	1,534	1,353	0,361	20,430	20,466	20,376	20,600
M 24	3	22,051	20,319	20,752	1,840	1,624	0,433	22,115	22,157	22,051	22,316
M 27	3	25,051	23,319	23,752	1,840	1,624	0,433	25,115	25,157	25,051	25,316
M 30	3,5	27,727	25,706	26,211	2,147	1,894	0,505	27,794	27,839	27,727	28,007
M 33	3,5	30,727	28,706	29,211	2,147	1,894	0,505	30,794	30,839	30,727	31,007
M 36	4	33,402	31,093	31,670	2,454	2,165	0,577	33,473	33,520	33,402	33,702
M 39	4	36,402	34,093	34,670	2,454	2,165	0,577	36,473	36,520	36,402	36,702
M 42	4,5	39,077	36,479	37,129	2,760	2,436	0,650	39,152	39,202	39,077	39,392
M 45	4,5	42,077	39,479	40,129	2,760	2,436	0,650	42,152	42,202	42,077	42,392
M 48	5	44,752	41,866	42,587	3,067	2,706	0,722	44,832	44,885	44,752	45,087
M 52	5	48,752	45,866	46,587	3,067	2,706	0,722	48,832	48,885	48,752	49,087
M 56	5,5	52,428	49,252	50,046	3,374	2,977	0,794	52,512	52,568	52,428	52,783
M 60	5,5	56,428	53,252	54,046	3,374	2,977	0,794	56,512	56,568	56,428	56,783
M 64	6	60,103	56,639	57,505	3,681	3,248	0,866	60,193	60,253	60,103	60,478
M 68	6	64,103	60,639	61,505	3,681	3,248	0,866	64,193	64,253	64,103	64,478

METRIC THREAD MA(OLD UNI 159 PROFILE)

NUT TOLERANCE SH8

M 1,7	0,35	1,473	1,246	1,246	0,227	0,227	0,040	1,493	1,507	1,473	1,529
M 2,3	0,4	2,040	1,780	1,780	0,260	0,260	0,040	2,061	2,076	2,040	2,120
M 2,6	0,45	2,308	2,016	2,016	0,292	0,292	0,050	2,331	2,346	2,308	2,388

TROUBLESHOOTING



TECHNICAL DATA

Trouble	Causes	Solutions
Tapped hole oversize	Incorrect tap in use (cutting geometry unsuitable for application)	Use tap selected from the relevant material group
	Faulty alignment	Ensure that the tap is correctly aligned with the core hole axis
	Cold welding	Improve lubrication and direction of coolant Adjust cutting speed
	Re-ground tap (lead-in is not concentric)	Regrind tap lead correctly on a suitable tap grinding machine

Trouble	Causes	Solutions
Stripped threads	Incorrect tap in use (cutting geometry incorrect for application)	Use a tap from the relevant material group.
	Spindle speed and feed rate not synchronized	Check feed rate programming and / or pitch of leading spindle Use a tapping spindle with axial float
	Insufficient start pressure exerted on tap with peel-cut	Increase start pressure

Trouble	Causes	Solutions
Bell mouthed tapped hole	Incorrect start pressure applied to tap	Use a tapping spindle with axial float

Trouble	Causes	Solutions
Unsatisfactory thread surface finish	Incorrect tap in use (Cutting geometry unsuitable for application)	Select tap from the relevant material group
	The tap is blunt	Replace or re-grind tap
	Tap badly re-ground	Re-grind tap again. Check that cutting geometry is suitable for material
	Coolant lacking in lubricating qualities and / or quantity	Ensure the use of a suitable coolant and an adequate supply

TROUBLESHOOTING



TECHNICAL DATA

Trouble	Causes	Solutions
Partial chipping of tap	Swarf jamming	Check cutting speed Use alternative tap type
	Tap has jammed against bottom of core hole	Check hole and thread depths Drill core hole deeper
	Tap incorrectly re-ground (lead-in diameter too small therefore too few cutting teeth)	Ensure that original values are maintained when regrinding
	Irregular workpiece material structure	Adjust cutting speed Improve lubricating quality of coolant

Trouble	Causes	Solutions
Excessive tap wear	Incorrect cutting speed	Adjust cutting speed to suit workpiece material
	Coolant lacking in lubricating qualities and / or quantity	Ensure the use of a suitable coolant and an ample supply Check that coolant is reaching the cutting zone
	Surface of the core hole is compacted	Check core hole drilling conditions (drill carefully to reduce risk of surface compacting) Check drill cutting edges

Trouble	Causes	Solutions
Tap breakage	Incorrect tap in use (cutting geometry unsuitable for application)	Use tap from the relevant material group
	Centering error	Ensure that axes of tap and core hole are aligned
	Blunt tap	Re-grind tap Ensure that taps are stored carefully
	Tap has reached bottom of core hole	Use tapping spindle with axial float and slipping clutch
	Core hole too small	Select correct size tapping drill

MATERIAL CHART



Please note: These charts are not cross-reference charts.
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ISO GROUP	STANDARDS					
	GERMANY		FRANCE	GREAT BRITAIN	EN & OTHER	U.S.A.
	W.Nr	DIN	AFNOR	B.S.	CLASSIFICATIONS	AISI
10 STEEL P	11. Magnetic soft steels - Hardness < 120 HB 30 - Tensile strength < 400 N/mm²					
	1.1013	RFe 100		OSOA12	EN2	
	1.1014	RFe 80				
	1.1015	RFe 60		230Mo7	EN1	
	1.0718	9 S MnPb 28				
	12. Structural steels - Hardness < 200 HB 30 - Tensile strength < 700 N/mm²					
	12.1 - Structural steels					
	1.0034	RSt 34-2	A34-2 EN	1449 34/20 HR		
	1.0035	St 33	A33	Fe 310-0		
	1.0036	St 37-2		060A35	EN3A,4,5,6,7,8	
1.0037	RSt 37-2			EN3B		
1.0044	St 44-2					
1.0050	St 50-2		4360-50B	EN 207		
1.0060	St 60-2					
1.0070	St 70-2					
1.0116	St 37-3					
1.0144	St 44-3					
12.2 - Case carburizing steels						
1.0301	C 10	AF 34 C 10	040 A 10		M 1010	
1.0401	C 15	AF 37 C 12	080 A 15		M 1015	
1.1121	Ck 10	XC 10	040 A 10		1010	
1.1141	Ck 15	XC 12	040 A 15		1015	
1.5732	14 Ni Cr 10	14 NC 11			3415	
1.7015	15 Cr 3	12 C 3	523 M 15		5015	
1.7131	16 Mn Cr 5	16 MC 4	527 M 17	EN 32	5115	
1.7147	20 Mn Cr 5	20 MC 5			5120	
12.3 - Free machining steels						
1.0710	15 S 10					
1.0715	9 S Mn 28	S 250	230 M 07		1213	
1.0718	9 S Mn Pb 28	S 250 Pb			12 L 13	
1.0721	10 S 20	10 F1	210 M 15		1108 1109	
1.0722	10 S Pb 20	10 Pb F 2			11 L 08	
1.0723	15 S 20		210 A 15			
1.0726	35 S 20	35 MF 6	212 M 36		1140	
1.0727	45 S 20	45 MF 4			1146	
1.0736	9 S Mn 36	S 300			1215	
1.0737	9 S Mn Pb 36	S 300 P			12 L 14	
12.4 - Cast structural steels						
1.0416	GS - 38					
1.0446	GS - 45					
1.0552	GS - 52					
1.0553	GS - 60	E 36 - 3				
1.0554	GS - 70					
13. Plain carbon steels - tempered						
13.1 - Steels, tempered - Hardness < 250 HB 30 - Tensile strength < 850 N/mm ²						
1.0402	C 22	1 C 22	070 M 20		M 1023	
1.0501	C 35	1 C 35	080 A 32		1035	
1.0503	C 45	1 C 45	060 A 47		1045	
1.0535	C 55	1 C 55	070 M 55		1055	
1.0601	C 60	1 C 60	060 A 62	EN 43	1060	
1.1157	40 Mn 4	35 M 5	150 M 36		1035 1041	
1.1151	Ck 22	2 C 22	055 M 15		1020 1023	
1.1181	Ck 35	2 C 35	080 A 35		1035 1038	
1.1191	Ck 45	2 C 45	080 M 46	EN 9, 10	1045	
1.1203	Ck 55	2 C 55	060 A 57		1055	
1.1221	Ck 60	2 C 60	060 A 62		1060 1064	

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	W.Nr	DIN	AFNOR	B.S.	CLASSIFICATIONS	AISI	
10 STEEL P	14. Alloy steels - Hardness < 250 HB 30, < 25 HRC - Tensile strength < 850 N/mm²						
	14.1 - Cold work tool steels						
	1.2056	90 Cr 3					
	1.2067	100 Cr 6	Y 100 C 6	BL 3		L 1 L 3	
	1.2080	X 210 Cr 12	Z 200 C 12	BD 3		D3	
	1.2083	X 42 Cr 13	Z 40 C 14			420	
	1.2363	X 100 CrMoV5 1	Z 100 CDV 5	BA 2		A 2	
	1.2379	X 155 CrMo 12 1	Z 160 CDV 12	BD 2		D 2	
	1.2510	100 MnCrW 4	90 MWCV 5	BO 1		O1	
	1.2550	60 WCrV 7	55WC 20	BS 1		S1	
	1.2823	70 Si 7					
	1.2826	60 Mn Si Cr 4					
	1.2842	90 MnCrV 8	90 MV 8	BO 2		O 2	
	14.2 - High speed steels						
	1.3202	S 12-4-4-5	Z130 WKC/V12-05-04-04	BT 15		T 15	
	1.3207	S 10-4-3-10	Z130 WKC/V10-10-04-04-03	BT 42		T 42	
	1.3243	S 6-5-2-5	Z85 WKC/V06-05-05-04-02	BM 35		M 35	
	1.3247	S 2-10-1-8	Z110 DKC/W09-08-04-02-01	BM 42		M 42	
	1.3343	S 6-5-2	Z85 WDC/V06-05-04-02	BM 2		M 2	
	1.3344	S 6-5-3	Z120 WDC/V06-05-04-03			M 3 / 2	
	1.3348	S 2-9-2	Z100 DC/W09-04-02-02			M 7	
	ASP 23	(S 6-5-3)					
	ASP 30						
	ASP 60						
	14.3 - Tempered steels						
	1.0503	C 45	1 C 45	060 A 47		1045	
	1.7220	34 Cr Mo 4	34 Cr Mo 4	708 A 37		4135, 4137	
	1.7225	42 Cr Mo 4	42 CD 4	708 A 42	EN 16, 17, 19	4140, 4142	
	1.7228	50 Cr Mo 4	50 Cr Mo 4	708 A 47		4150	
	14.4 - Nitriding steels						
	1.7779	20 Cr Mo V 13.5					
	1.8504	34 Cr Al 6					
	1.8506	34 Cr Al S 5					
	1.8507	34 Cr Al Mo 5	30 CAD 6.12			A 355 Cl.D	
	1.8509	41 Cr Al Mo 7	40 CAD 6.12	905 M 39		A 355 Cl.A	
	1.8515	31 Cr Mo 12	30 CD 12	722 M 24			
	10 HARDENED STEEL H	15. Alloy steels / Tempered steels - Hardness 250-350 HB 30, 25-38 HRC - Tensile strength 850-1,200 N/mm²					
		15.1 - Alloy steels for tools					
		1.2311	40 Cr Mn Mo 7				
		1.2312	40 Cr Mn Mo S 86				
1.2436		X 210 Cr W 12	Z 200 CW 12				
1.2711		54 Ni Cr Mo V 6					
1.2713		55 Ni Cr Mo V 6	55 NCDV 7	826 M 40	S 95, S 97, S 98	L 6	
1.2714		56 Ni Cr Mo V 7					
1.2743		60 Ni Cr Mo V 12 4					
1.2766		35 Ni Cr Mo 16					
15.2 - Alloy steels for hot work							
1.2343		X 38 Cr Mo V 5 1	Z 38 CDV 5	BH 11		H 11	
1.2344		X 40 Cr Mo V 5 1	Z 40 CDV 5	BH 13		H 13	
1.2365		X 32 Cr Mo V 3 3	32 DCV 28	BH 10		H 10	
1.2367		X 40 Cr Mo V 5 3	Z 38 CDV 5.3				
1.2581		X 30 W Cr V 9 3	Z 30 WCV 9.3	BH 21		H 21	
1.2622		X 60 W Cr Mo V 9					
1.2678		X 45 CoCrWV 5 5 5					
1.2550		60 WCr V 7	55 WC 20	BS 1		S 1	
1.2567		X 30 W Cr V 5 3	Z 32 WCV 5				

MATERIAL CHART



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	W.Nr	DIN	AFNOR	B.S.	CLASSIFICATIONS	AISI
10 HARDENED STEEL H	15.3 -Hardened tempered steels - Hardness may differ according to presentation and dimensions of material					
	1.5864	35 Ni Cr 18				
	1.6580	30 Cr Ni Mo 8	30 Cr Ni Mo 8		S99	
	1.7361	32 Cr Mo 12	30 CD 12	722 M 24		
	1.7707	30 Cr Mo V 9				
	1.8161	58 Cr V 4				
	15.4 - Nitriding steels					
	1.8515	31 Cr Mo 12	30 CD 12	722 M 24		
	1.8519	31 Cr Mo V 9		830 M 31		
	1.8523	39 Cr Mo V 13 9		897 M 39		
	1.8550	34 Cr Al Ni 7		826 M 40		
	16. Alloy steels / Hardened tempered steels - Hardness > 38 HRC - Tensile strength > 1,200 N/mm ² To this group belong most of the materials of group 15, but present a higher tensile strength					
	1.2713	100 Mn Cr W 12			Hardox 400	M42
	1.3247	X 210 Cr 12			Hardox 500	4140
	1.2080				Hardox 600	8130
	1.3343				P20	
20 STAINLESS STEEL M	21. Free machining stainless steels - Hardness < 250 HB 30 - Tensile strength < 850 N/mm ²					
	1.4104	X 12 Cr Mo S 17	Z 13 CF 17	416 S 37	EN 56	430 F
	1.4305	X 10 Cr Ni S 18 09	Z 8 CNF 18-09	303 S 21	EN 60	303
	22. Austenitic stainless steels - Hardness < 250 HB 30 - Tensile strength < 850 N/mm ²					
	1.4300	X 12 Cr Ni 18 8		320 S 12		
	1.4301	X 5 Cr Ni 18 10	Z 6 CN 18-09	304 S 15	EN 80, EN 58 + C	304
	1.4311	X 2 CrNi 18 10	Z 3 CN 18-07 Az	304 S 61		304 LN
	1.4406	X 2 CrNiMoN 17 12 2	Z 3 CND 17 11 02	316 S 61		316 LN
	1.4433	X 2 CrNiMo 18 15		316 S		
	1.4435	X 2 CrNiMo 18 14 3	Z3 CND 17-12-03	316 S 11		316 L
	1.4539	X 1 CrNiMoCu 25 20 5	Z 1 NCDU 25-20	321 S 17		UNS N08904
	1.4541	X 6 CrNiTi 18 10	Z 6 CNT 18 10	321 S 18	EN 58 J, 316	321
	1.4571	X 6 CrNiMoTi 17 12 2	Z 6 CNDT 17 12	320 S 18		316 Ti
	1.4573	X 10 CrNiMoTi 18 12		320 S 33		
	1.4828	X 15 CrNiSi 20 12	Z 15 CNS 20-12	309 S 24		309
	22.1 - Cast austenitic stainless steels					
	1.4308	G-X 6 CrNi 18 9	Z 6 CN 18.10 M	304 C 15(LT196)		CF-8
	1.4313	G-X 5 CrNi 13 4	Z 8 CD 17-01	425 C 12		CA 6 -NM
	1.4408	G-X 6 CrNiMo 18 10		316 C 16(LT196)		CF-8M
	1.4581	G-X 5 CrNiMoNb 18 10	Z 4 CNDNb 18.12M	318 C 17		
	23. Martensitic stainless steels - Hardness < 320 HB 30 - Tensile strength < 1,100 N/mm ²					
	1.4021	X 20 Cr 13	Z 20 C 13	420 S 37		420
	1.4034	X 46 Cr 13	Z 44 C 14	(420 S 45)		
	1.4057	X 20 CrNi 17 2	Z 15 CN 16-02	431 S 29		431
	1.4112	X 90 CrMoV 18				
	1.4116	X 45 CrMoV 15			EN 58, b.e.j.t	
	1.4125	X 105 CrMo 17	Z 100 CD 17		Duplex alloys	440 C
	1.4718	X 45 CrSi 9 3	Z 45 CS 9	401 S 45		HNV 3
	1.4747	X 80 CrNiSi 20	Z 80 CSN 20-02	443 S 65		HNV 6
	1.4086	G-X 120 Cr 29				
	1.4106	G-X 10 CrMo 13				
	1.4138	G-X 120 CrMo 29 2				
	23.1 Ferritic stainless steels - Hardness < 320 HB 30 - Tensile strength < 1,100 N/mm ²					
	1.4002	X 6 Cr Al 13	Z 8 CA 12	405 S 17		405
	1.4006	X 10 Cr 13	Z 10 C 13	410 C 21	Super Duplex	410
	1.4016	X 6 Cr 17	Z 8 C 17	430 S 17		430
	1.4510	X 6 Cr Ti 17	Z 8 CT 17			430 Ti
	1.4512	X 6 Cr Ti 12	Z 6 CT 12	409 S 19		409
	23.2 Ferritic-Austenitic stainless steels - Hardness < 320 HB 30 - Tensile strength < 1,100 N/mm ²					
	1.4460	X 8 CrNiMo 27 5	Z 5 CND 27-05 Az			329
	1.4582	X 4 CrNiMoNb 25 7				
	1.4821	X 20 CrNiSi 25 4				17-4PH

MATERIAL CHART



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ISO GROUP	STANDARDS					
	GERMANY		FRANCE	GREAT BRITAIN	EN & OTHER	U.S.A.
	W.Nr	DIN	AFNOR	B.S.	CLASSIFICATIONS	AISI
30 CAST IRON K	31. Grey graphite cast irons - Hardness < 150 HB 30 - Tensile strength < 500 N/mm ²					
	0.6010	GG-10	Ft 10 D			A 48-20 B
	0.6015	GG-15	Ft 20 D	Grade 150	Grey cast iron soft	A 48-25 B
	0.6020	GG-20	Ft 25 D	Grade 220		A 48-30 B
	0.6025	GG-25	Ft 30 D	Grade 260		A 48-40 B
	0.6030	GG-30	Ft 30 D	Grade 300		A 48-45 B
	0.6035	GG-35	Ft 35 D	Grade 350		A 48-50 B
	0.6040	GG-40	Ft 40 D	Grade 400		A 48-60 B
	31.1 - Meehanite - Hardness < 150 HB 30 - Tensile strength < 500 N/mm ²					
		GF - 150				
		GD - 260				
	32. Grey graphite cast irons - Hardness 150 - 300 HB 30 - Tensile strength 500 - 1,000 N/mm ²					
	0.6020	GG - 20	Ft 25 D	Grade 220	Grey cast iron hard	A 48-30 B
	0.6025	GG - 25	Ft 30 D	Grade 260		A 48-40 B
	0.6030	GG - 30	Ft 30 D	Grade 300		A 48-45 B
	0.6035	GG - 35	Ft 35 D	Grade 350		A 48-50 B
	0.6040	GG - 40	Ft 40 D	Grade 400		A 48-60 B
	32.1 - Meehanite - Hardness 150-300 HB 30 - Tensile strength 500-1,000 N/mm ²					
		GF - 150				
		GD - 260				
	33. Nodular graphite, malleable cast irons - Hardness < 200 HB 30 - Tensile strength < 700 N/mm ²					
	0.7033	GGG-35.3				
	0.7040	GGG-40	FGS 400-12	420 / 12		60-40-18
	0.7043	GGG-40.3	FGS 370-17	370 / 17		
	0.7050	GGG-50	FGS 500-7	500 / 7		
	0.7060	GGG-60	FGS 600-3	600 / 3	S.G.iron, Meehanite	65-45-12
	0.8035	GTW-35		700/2,30g/72	Black & White Heart	80-55-06
	0.8040	GTW-40				
	0.8045	GTW-45				
	0.8065	GTW-65				
	0.8135	GTS-35				
	0.8145	GTS-45				
0.8155	GTS-55					
0.8165	GTS-65					
33.1 - Meehanite - Hardness < 200 HB 30 -Tensile strength < 700 N/mm ²						
	SF 400					
	SPF 600					
34. Nodular graphite, tempered malleable cast irons - Hardness 200-300 HB 30 - Tensile strength 700-1,000 N/mm ² Also materials from Group 33 tempered						
0.7070	GGG-70	FGS 700-2	700 / 2	S.G.iron,Meehanite	100-70-03	
0.7080	GGG-80	FGS 800-2	800 / 2	Black & White Heart	120-90-02	
34.1 - Meehanite - Hardness 200-300 HB 30 - Tensile strength 700-1,000 N/mm ²						
	SH 800		420/12, P 440/7			
	SH 1000					
40 TITANIUM S	41. Titanium, unalloyed - Hardness < 200 HB 30 - Tensile strength < 700 N/mm ²					
	3.7024.1LN	Ti 99.5				
	3.7034.1LN	Ti 99.7				
	3.7035	Ti 2				
	3.7055	Ti 99.4		TA 1-9	Ti 99,0	
	3.7064.1LN	Ti 99.2				
	3.7065	Ti 4				
	3.7255	Ti 3 Pd				
	42. Titanium alloys - Hardness < 270 HB 30 - Tensile strength < 900 N/mm ²					
		Ti4Al4 Mn				
	3.7144 LN	Ti5Al2Sn				
	3.7124 LN	Ti2Cu		TA 10-14, TA 17	Ti - 2AL	
	3.7164 LN	Ti6Al4V		TA 18		
	3.7174 LN	Ti6Al6V2Sn				
	Ti6Al2Sn4Zr2Mo					
	Ti4Al4Mo2Sn0.5Si					

MATERIAL CHART



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ISO GROUP	STANDARDS						
	GERMANY		FRANCE	GREAT BRITAIN	EN & OTHER	U.S.A.	
	W.Nr	DIN	AFNOR	B.S.	CLASSIFICATIONS	AISI	
40 TITANIUM S	43. Titanium alloys - Hardness 270-300 HB 30 - Tensile strength 900-1,300 N/mm²						
		Ti10Al2Fe3Al					
		Ti5Al5V5Mo3Cr			Ti AL		
		Ti7Al4Mo		TA 10-13, TA 28			
		Ti3Al8V6Cr4Zr4Mo					
		Ti6Al6V6Sn					
	Ti15V3Cr3Sn3Al						
50 NICKEL ALLOYS S	51. Nickel, unalloyed - Hardness < 150 HB 30 - Tensile strength < 500 N/mm²						
	2.1504 LN	Ni Al Bz					
	2.4042	Ni 99 CSi		NA 11, NA 12	Nickel 200		
	2.4060	Ni 99.6			Nickel 270		
	2.4062	Ni 99.4 Fe					
	52. Heat resisting nickel alloys - Hardness < 270 HB 30 - Tensile strength < 900 N/mm²						
	2.4360 LN	Monel 400					
	2.4374 LN	Monel 500					
	2.4617	Hastelloy B 2			Nimonic 75		
	2.4665	Hastelloy X		HR 203			
	2.4812	Hastelloy C		3027-76	Hastelloy C		
	2.4816	Inconel 600, 617, 625			Haynes Alloys 263		
	1.4876	Incoloy 800, 825					
	2.4983	Udimet 500					
	53. Heat resisting nickel alloys - Hardness 270-410 HB 30 - Tensile strength 900-1,400 N/mm²						
2.4631	Nimonic 80 A			Nimonic 80			
2.4632	Nimonic 90						
2.4634	Nimonic 105						
2.4662	Nimonic 901		HR 8				
2.4668	Inconel 718		HR 401, 601	Rene 41			
2.4669	Inconel 750-X						
2.4670 LN	Nimocast 713			Incoloy 925			
2.4674 LN	Nimocast PK 24						
2.4856	Inconel 625			Monel K-500			
2.6554 LN	Waspaloy						
60 COPPER N	61. Copper, unalloyed - Hardness < 100 HB 30 - Tensile strength < 350 N/mm²						
	2.0060	E - Cu 57					
	2.0070	SE - Cu			Commerially Pure		
	2.0090	SF - Cu		C 101			
	2.1356	Cu Mn 3					
	2.1522	Cu Si 2 Mn					
	62. Short chip copper alloys - Hardness < 200 HB 30 - Tensile strength < 700 N/mm²						
	62.1 - Brass						
	2.0360	Cu Zn 40(MS 60)					
	2.0380	Cu Zn 39 Pb 2 (MS 58)		CZ120, CZ109			
	2.0410	Cu Zn 44 Pb 2		PB104			
	2.0561	Cu Zn 40 Al 1			2.1030, 2.1080		
	2.0580	Cu Zn 40 Mn 1 Pb					
	2.0771	Cu Ni 7 Zn 39 Mn 5 Pb3					
	62.2 - Bronzes						
	2.1086	G-Cu Sn 10 Zn					
	2.1093	G-Cu Sn 6 Zn Ni					
	2.1096	G-Cu Sn 5 Zn Pb					
	63. Long chip copper alloys - Hardness < 200 HB 30 - Tensile strength < 700 N/mm²						
	63.1 - Brass						
	2.0250	Cu Zn 20					
	2.0265	Cu Zn 30					
	2.0321	Cu Zn 37		CZ108, CZ106			
	2.0335	Cu Zn 36 (Ms 63)					
60 COPPER N	63.2 - Bronzes						
	2.1020	Cu Sn 6					
	2.1030	Cu Sn 8					
	2.1080	Cu Sn 6 Zn 6					
	63.3 - Copper alloys tempered by forging						
	2.1245	Cu Be 1.7					
	2.1247	Cu Be 2					
	2.1293	Cu Cr Zr					
	64. Cu - Al - Fe alloys Hardness < 440 HB 30 - Tensile strength < 1,500 N/mm²						
	64.1 - Ampco						
		Ampco 18			Ampco 18		
		Ampco 20		AB 1 type			
		Ampco 25			Ampco 26		
	70 ALUMINIUM N	71. Aluminium - Magnesium, unalloyed - Hardness < 100 HB 30 - Tensile strength < 350 N/mm²					
		3.0250	Al 99.5 H		LM0, 1B		
		3.0280	Al 99.8 H				
		3.0305	Al 99.9				
		3.3308	Al 99.9 Mg 0.5				
		72. Aluminium alloys, Si < 0.5% - Hardness < 180 HB 30 - Tensile strength < 600 N/mm²					
		72.1 - Forging aluminium alloys					
		3.0515	Al Mn 1		LM5, 10, 12		
		3.0516	S-Al Mn				
		3.0525	Al Mn 1 Mg 0.5			6061	
		3.0615	Al Mg Si Pb				
3.1325		Al Cu Mg 1					
3.1355		Al Cu Mg 2					
3.3315		Al Mg 1					
3.3535		Al Mg 3					
3.4365		Al Zn Mg Cu 1.5					
72.2 - Cast aluminium alloys							
3.1841		G - Al Cu 4 Ti					
3.3241		G - Al Mg 3 Si					
3.3292		GD - Al Mg 9					
73. Aluminium alloys, 0.5-10% Si - Hardness < 180 HB 30 - Tensile strength < 600 N/mm²							
73.1 - Cast aluminium alloys							
3.2134		G - AL SI 5 CU 1 MG		LM2, 4	6063		
3.2152		GD - Al Si 6 Cu 4		LM16, 18, 21	6082		
3.2162	GD - AL SI 8 CU 3		LM22, 24, 25				
3.2373	G - AL SI 9 MG		LM26, 27				
74. Aluminium alloys, Si > 10% - Hardness < 180 HB 30 - Tensile strength < 600 N/mm²							
74.1 - Cast aluminium alloys							
3.2381	G - AL SI 10 MG		LM6,12,13				
3.2383	G - AL SI 10 MG (CU)		LM20,28				
3.2581	G - AL SI 12		LM29, 30				
3.2583	G - AL SI 12 (CU)						
3.2982	GD - AL SI 12 (CU)						
74.2 - Cast aluminium - magnesium alloys							
3.5106	G - MG AG 3 SE 2 ZR 1						
3.5662	G - MG AL 6						
3.5812	G - MG AL 8 ZN 1						
3.5912	G - MG AL 9 ZN 1						
80 SYNTHETIC MATERIAL O	81. Thermoplastics						
				Nylon	Nylon		
				PVC Cellulose	PVC		
				Acetate	Acetal		
	82. Thermosetting Plastics						
				Tufnol			
			Bakelite	Bakelite			
83. Reinforced Plastics							
			CFRP, GFRP				
			Printed Circuit Board				
			Kevlar	Kevlar			

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	W.Nr	DIN	AFNOR	B.S.	CLASSIFICATIONS	AISI	
60 COPPER N	63.2 - Bronzes						
	2.1020	Cu Sn 6					
	2.1030	Cu Sn 8					
	2.1080	Cu Sn 6 Zn 6					
	63.3 - Copper alloys tempered by forging						
	2.1245	Cu Be 1.7					
	2.1247	Cu Be 2					
	2.1293	Cu Cr Zr					
	64. Cu - Al - Fe alloys Hardness < 440 HB 30 - Tensile strength < 1,500 N/mm²						
	64.1 - Ampco						
		Ampco 18			Ampco 18		
		Ampco 20		AB 1 type			
		Ampco 25			Ampco 26		
	70 ALUMINIUM N	71. Aluminium - Magnesium, unalloyed - Hardness < 100 HB 30 - Tensile strength < 350 N/mm²					
		3.0250	Al 99.5 H		LM0, 1B		
		3.0280	Al 99.8 H				
		3.0305	Al 99.9				
		3.3308	Al 99.9 Mg 0.5				
		72. Aluminium alloys, Si < 0.5% - Hardness < 180 HB 30 - Tensile strength < 600 N/mm²					
		72.1 - Forging aluminium alloys					
		3.0515	Al Mn 1		LM5, 10, 12		
		3.0516	S-Al Mn				
		3.0525	Al Mn 1 Mg 0.5			6061	
		3.0615	Al Mg Si Pb				
3.1325		Al Cu Mg 1					
3.1355		Al Cu Mg 2					
3.3315		Al Mg 1					
3.3535		Al Mg 3					
3.4365		Al Zn Mg Cu 1.5					
72.2 - Cast aluminium alloys							
3.1841		G - Al Cu 4 Ti					
3.3241		G - Al Mg 3 Si					
3.3292		GD - Al Mg 9					
73. Aluminium alloys, 0.5-10% Si - Hardness < 180 HB 30 - Tensile strength < 600 N/mm²							
73.1 - Cast aluminium alloys							
3.2134		G - AL SI 5 CU 1 MG		LM2, 4	6063		
3.2152		GD - Al Si 6 Cu 4		LM16, 18, 21	6082		
3.2162	GD - AL SI 8 CU 3		LM22, 24, 25				
3.2373	G - AL SI 9 MG		LM26, 27				
74. Aluminium alloys, Si > 10% - Hardness < 180 HB 30 - Tensile strength < 600 N/mm²							
74.1 - Cast aluminium alloys							
3.2381	G - AL SI 10 MG		LM6,12,13				
3.2383	G - AL SI 10 MG (CU)		LM20,28				
3.2581	G - AL SI 12		LM29, 30				
3.2583	G - AL SI 12 (CU)						
3.2982	GD - AL SI 12 (CU)						
74.2 - Cast aluminium - magnesium alloys							
3.5106	G - MG AG 3 SE 2 ZR 1						
3.5662	G - MG AL 6						
3.5812	G - MG AL 8 ZN 1						
3.5912	G - MG AL 9 ZN 1						
80 SYNTHETIC MATERIAL O	81. Thermoplastics						
				Nylon	Nylon		
				PVC Cellulose	PVC		
				Acetate	Acetal		
	82. Thermosetting Plastics						
				Tufnol			
			Bakelite	Bakelite			
83. Reinforced Plastics							
			CFRP, GFRP				
			Printed Circuit Board				
			Kevlar	Kevlar			